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The Journal of
Sociologic Medicine

Continuing the Bulletin of the

American Academy of Medicine

OCTOBER, 1915

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The *American Academy of Medicine* is an association engaged in direct and positiv social service, altho its methods are those of investigation and discussion, rather than those of direct application.

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B. To study the factor of medicine in social problems that the horizon of medicine be broadened, and its efficiency increast in problems investigated.

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THE AMERICAN ACADEMY OF MEDICINE is not responsible for the sentiments exprest in any paper or article publisht in the JOURNAL.

LEADING ARTICLE.

THE TREND OF LEGISLATION IN INDIANA.

As illustrated by the Session of 1915.

Legislation in Indiana, insofar as it relates to social well-being, developt this year along two lines: one, preventiv or constructiv; the other, additional provision for institutional work.

Under the first classification may be mentioned, as most important, laws providing for workmen's compensation, the registration of every case of tuberculosis, the abatement of houses of prostitution, industrial aid for the blind, and the punishment of wilful family neglect.

Some of these measures establish new principles in social work in Indiana. This is true of the workmen's compensation act, which has in view the prevention of industrial accidents, adequate medical and surgical care for injured employes, and compensation for personal injuries or death. The administration of the law is placed in the hands of a state industrial board, with a staff of inspectors. From the reports of accidents, which all employers of labor must make under this law, and the knowledge of living conditions of workmen, which the state industrial board will gain, there will in time accumulate a mass of facts invaluable in framing future industrial legislation.

The former inadequate laws of the state for the suppression of prostitution are superseded by a new measure following closely the injunction and abatement law of the District of Columbia and some of the states. Any one who owns, occupies, leases or operates such a place is deemed guilty of maintaining a nuisance, and the property and grounds also are deemed a nuisance and may be enjoined and abated. Any citizen, as well as the prosecuting attorney, may institute proceedings.

The so-called "lazy husband law" of 1915 also establishes a new principle in Indiana in providing that earnings of convicted prisoners at the rate of one dollar for each day's work, shall be paid their dependent families. This law applies to jail prisoners only. It is expressly declared not to repeal, even by implication, the excellent non-support law and the child-neglect law of former years, which the juvenile courts of Indiana have found effectiv in dealing with recreant parents.

Branding tuberculosis as "an infectious and communicable disease, dangerous to the public health," the legislature of 1915 made provision requiring the registration of every case of the disease and the disinfection of premises following the removal or death of a tubercular person. The state Board of Health is to administer the law. While the board was given no additional funds to meet the expense, it is taking steps to carry out the intent of the law. With the state tuberculosis hospital, now in its fifth year, and the enabling act under which the counties are from time to time establishing local hospitals, this new statute places one more weapon in the hands of those who are fighting this great scourge.

Industrial education for the adult blind is made possible by one of the new laws, the act carrying an annual appropriation of $10,000. It provides for the maintenance of a bureau to find employment, teach industries and market the products, for the establishment of training schools and for co-operation with the State Board of Health in adopting and enforcing measures for the prevention of blindness.

Under the second classification mentioned, that of institutional work, come notably the additional facilities and appropriations intended to advance the state's system of farm colonies for public wards. The oldest of these is a farm of 509 acres connected with the School for Feeble Minded Youth, at Fort Wayne. Later came the Village for Epileptics at New Castle. Heretofore, on its 1,246 acre farm, it has had cottages for men and boys only. At this session it was given $30,000 for two additional cottages for males, and $100,000 in round numbers for the beginning of a colony for women and girls. "Wayne Farm," the colony of the Eastern Hospital for Insane, at Richmond, was granted additional funds for equipment of its 421-acre tract, and the Indiana State Farm for misdemeanants, located at Putnamville, likewise received a substantial appropriation for development. This last is the state's newest institution. Its 1,600 acres of land furnish healthful employment in abundance for men who, as a class, have heretofore served their sentences in idleness in county jails. Escape from this farm, which has no surrounding wall, is punishable with a two to five year sentence to the State Prison.

Altogether, social workers felt encouraged by the amount of attention given their special field by the General Assembly. No backward steps were taken—in fact, few measures of a reactionary nature were introduced. An attempt was made to secure a so-called mother's pension law, but there was noticed a decided disposition on the part of the Legislature to depend for a while longer on the excellent system of public outdoor poor relief in this state. However, the Legislature authorized the Governor to appoint a commission to study the situation and possible needs in Indiana.

AMOS W. BUTLER.
Secretary Indiana Board of State Charities.

STATE HOUSE, INDIANAPOLIS.

THE HOSPITAL ORGANIZATION OF RAILWAY SYSTEMS.[1]

By C. W. Hopkins, M.D., Chief Surgeon, Chicago and Northwestern Railway Company, Chicago.

Some years ago a distinguisht English writer precipitated almost a world-wide controversy by discussing the question "IS LIFE WORTH LIVING?" It is safe to say that the decision was in the affirmativ. To-day, if the same writer were to present the question "IS LIFE WORTH SAVING?" the vote would be in the affirmativ without discussion.

The civilized countries of the entire world are to-day working out a comprehensiv system for the effectual elimination of a great part of the immense economic loss that follows inefficient protection of their people from preventable disease, injuries and unnecessary death. In Great Britain it has been estimated and defended in debate, that thirty per cent. of the pauperism may be attributable to sickness. Holland, Austria, Bohemia and Italy, each to a lesser degree, have workt out a partial solution of this economic problem, and the United States, thru the different workmen's compensation acts, together with the great "SAFETY FIRST" movement of different industries, is doing a work of inestimable value toward the elimination of needless waste of human life and limb, which in past decades has cost the state, the municipality, the employer and the employe many millions of dollars annually, by what, to-day, is known to be preventable.

Employers of labor have devoted the keenest analysis to this subject, and the brainiest and most far seeing of them are most activ in health movements among their employes, and in the development of health departments as an important part of their great industrial organizations. Many large industrial enterprises have developt just as efficient departments of health as are to be found even in the most advanced municipalities. The per capita expenditure for health in some of these industrial groups is greater than the per capita expenditure of the average efficient municipal health department, and, further, there is this advantage, in that the result reaches more directly the individual who needs it.

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[1] Read at the 40th Annual Meeting of the American Academy of Medicine, San Francisco, June 28, 1915.

There is no form of organization which is so wonderful or so complicated as that of the railroads, especially the American railroads, and it is because of these peculiarities that we, as medical men, have before us the greatest field for the greatest of all work —the conservation of men. *The especially qualified and practically trained employe is the greatest asset of the modern railroad manager, and it is realized that the greatest efficiency results from the best protection of the health and the activity of the experienced employe.* It is very expensiv to thoroly train a man for railroad service, and that system which will enable the well trained employe to work the greatest number of days in a given year, as well as keep him in the best state of physical efficiency, is of the highest importance.

The following quotation is from an eminent member of the medical profession, Dr. Osler, formerly of Johns Hopkins University.

> Within the past three centuries, the average working life of the English speaking men has doubled. In Shakespeare's time, the fifties were venerable; Admiral Coligny, murdered at fifty-three, is described by his contemporary biographer as a very old man. Now, when we hear of death in the sixties, we instinctively feel it an untimely cutting off in what should be a fresh and vigorous age, and, even at eighty, it seems but just fair ripeness for the sickle.
>
> The three factors which have wrought this change are: Advanced Physical Comfort, Medicine and its handmaid, Hygiene, and Surgery. And in the mitigation of the frightful mass of actual pain, of physical torment, which has racked every age down to the present, and which has scarecely been alleviated till the past century, medicine stands incomparably first.

In substantiation of his statement I will say that in the last fifteen years there have been many railroad employes retired on pension, many of whom were seventy years of age, and some still living who are less than ten years short of one hundred.

A biblical limit of three score and ten will eventually be the natural heritage of every man, and the railroads, with the assistance of the medical departments and company surgeons, are engaged in an earnest effort to bring about this condition as promptly as it is possible so to do.

The suffering and sorrow due to either sickness or accident is alone sufficient to enlist the sympathy of the most indifferent, but, aside from this, the expense of sickness and injury to the company and the loss of wages to the men is enormous, and if there were no other reasons, the necessity for operating the road at a minimum cost would alone be sufficient to justify the great work in science and safety tending toward the conservation of men which has been so earnestly undertaken.

The enumeration of one hundred and forty-one kinds of injuries, to say nothing of the myriad of diseases, implies an equal number of different kinds of treatment, and it is very necessary that the treatment shall be scientific and right, for it is not only immunity from suffering that the management of a railroad is striving for, but also for a minimum disability on account of sickness and injury. Thus, if a man fractures his knee, or leg, sprains his arm, dislocates his shoulder, twists his back or sustains any other kind of injury, and his recovery is dependent upon proper treatment, that is just what the management wants him to receive. For a poor job on a fractured leg, or any other maltreatment, extends the period of disability and increases the liability, to say nothing of unnecessary suffering. On a great railroad system, employing one hundred thousand men, of whom a large percentage are injured or reported sick annually, the necessity for scientific treatment is imperativ.

The idea of a large industrial organization having attacht to it a department which has to do with the medical and surgical care of the employes, is far from new, either as applied to railroads or other industries, but to anyone who will investigate this subject from its beginning, the remarkable growth and development that has taken place, especially in the last several years, as regards such a department, are truly wonderful. Not only do these departments have to do with the sick and the injured employes, but latterly that which is of far more value both to the employe and the industries has received great attention and study, namely, prevention. Prevention not only of accidents, but, what is of more importance, prevention of diseases and prevention of the more serious conditions and possible complications by the earliest recognition of a beginning disorder, and by prompt scientific and efficient treatment.

Ours is the duty to prevent that great economic waste which inevitably results from the failure of an individual to place about himself certain safe-guards which will protect him from pernicious habits and diseases. Independently, perhaps, our profession cannot accomplish definit results in the great industrial and economic world about us, but as educators and directors of the controlling influences in this world, our assistance can become of such importance that it becomes essential in the modern industry.

In the medicine and surgery of to-day we find that this is the age of specialists, and, just as in the industrial life, organization is necessary in order to produce definit results.

One of the great problems confronting the railroads to-day is that of conservation of its employes, with the raising of the standard of efficiency. It is now a well recognized fact among the managements of the railroads that it is just as important to care for their sick and injured as it is to maintain a certain standard of efficiency or perfection of their rolling stock and road bed. The state governments, as well, are also seriously considering the importance of this fact, and are endeavoring to co-operate with the different corporations toward this end.

Certain standards must necessarily come sooner or later. Whether we have reacht this time or not it is impossible to say, but it is certainly worth while to make a trial, or perhaps I should more properly say, to commence the campaign for higher standards. Leaving aside the question of wages, which we have nothing to do with except in an argumentativ way, we come to a desired condition of the industrial worker which promises to lead to the best results. In the first place, the man should feel well and he should be free from worry and anxiety. The first consideration is proper housing, where the best sanitary conditions may be developt, and where a man can feel the environments of a home. These conditions are fundamental and it should be the province of the corporation, as it is in Europe, of the Government, to inspect the environment of the working classes, so that desirable conditions may be maintained that will contribute to the health of the workmen. Of course, in the higher class of workmen, such as men having charge of trains, such inspection would not be necessary because as a rule these men would be quite able to order their own environment.

Another step toward efficiency lies in the direction of physical examinations with reference to determining the approach of disease in its incipient stage, for instance: Bright's disease, diabetes, arteriosclerosis, cancer, tuberculosis, etc. These examinations should be made by men selected for their skill in physical examination and diagnosis. There should be an understanding also with the workman that this examination is not for the purpose of preparing him for the "scrap pile," but for the purpose of maintaining a condition of bodily health that will materially prolong his working days, together with a higher degree of earning capacity and efficiency.

Different railroad corporations have given this subject profound thought for many years, and much time and money has been spent in an effort to bring about the best methods to ensure the greatest welfare to the employe, and at the same time derive the greatest economic benefit for themselves.

Two general methods have been in use for some years by forty-two representativ railroads of this country, with the general predominance in favor of the hospital organization, where the men themselves contribute a certain monthly amount toward their maintenance. Twenty-four of the forty-two railroads are to-day using the hospital organization, some of which were establisht as long as fifty years ago. This was primarily brought about on account of a certain number of these roads running thru a very sparsely settled country, where settlements and doctors were few and far between, and where there were no hospitals, and where it was found that men often suffered and sometimes died because of lack of immediate and proper care. By a small contribution by the men they were enabled to receive the proper care by good men, and to enjoy the comforts that were necessary toward their well-being, and with but small cost to themselves.

The other eighteen roads employ surgeons and hospitals and treat their men for occupational injuries, paying all bills for such treatment and care without the small monthly assessment contributed by the men. There have been many arguments, by learned economists, both for and against each method.

So many questions economic, political and social, enter into the matter of how far a railroad is in duty bound to furnish surgical and medical aid to its employes, on account of the many different compensation laws of the various states thru which a railroad may run, that to arrive at any definit conclusion at this time seems to be almost an impossibility.

The benefits to be derived from a hospital organization, on account of the services rendered to the employes of the railroad by the surgical and medical forces, as well as from the standpoint of the corporation, can be considered under four general heads.

HUMANITARIAN.

It is a well-known fact that many of the diseases from which workmen suffer can be treated in their incipiency by well regulated hospital methods and by skilled men with instruments of precision that will bring about, if not a cure, a very natural prolongation of life and a period of working efficiency, for instance: in diabetes, where under favorable conditions control over patients can be maintained, the degree of tolerance can be determined. This and many other diseases, when not detected in the early stages, on account of the undermining process of the health of the individual and consequent lowered efficiency, may frequently be the cause of accidents.

When sickness or unavoidable accidents do occur, the patient is enabled to receive attention and comfort which might be impossible if he were left to his own devices.

It relieves him of a financial strain, thereby giving him mental comfort which would frequently materially shorten his period of suffering.

ECONOMIC.

It so often happens that a home environment, even of comfort, is unfavorable in a continued sickness, and the expense of a prolonged illness, where it becomes necessary to secure the services of a nurse, is so great that a typhoid fever case, for example, might absorb the surplus earnings of a year, and produce a degree of worry and anxiety that would lessen materially the workman's efficiency.

The question of hospital care for the employes in the case of sickness is just as important as the question of hospital care in case of injury. We have come to the time when we recognize that the saving of a part of an arm or leg may be of material value, or the saving of a partially crippled arm or leg may be of very great value to the injured workman, and this saving may only be attained under the best hospital surroundings and in the hands of the best trained men in emergency surgery.

The question of efficiency is not alone a question for the corporation and for the workman, but it is a question for the general public. The state gains whenever a sick workman can cut short his sickness and can resume his place, not only so far as he as a workman is concerned, but also his family, because sickness under any condition is more or less of a burden upon the public. It is likewise of importance to the state that the number of cripples should be reduced to the minimum.

It has been estimated by certain railroads that it costs five hundred dollars to train an employe before he becomes a thoroly safe and efficient workman and able to be trusted with the safety and lives of the traveling public. The saving of the life and limb of their trained employes naturally reduces this cost as well as prevents injury to passengers and destruction of property, on account of mistakes of the inexperienced.

Proper treatment naturally shortens disability and, therefore, works a saving by getting the efficient man back to his duties early.

It prevents the financial burden of the fellow employe which is often occasioned by neighborhood assessments on account of sickness and want caused by the financial strain brought about by long, drawn-out illness.

It serves to keep the sick employe out of the hands of unskilled doctors who make improper diagnoses and render improper treatment, thereby neglecting the illness and causing heavy financial strain by their neglect and in many cases complete failure of recovery.

ETHICAL.

The charge of contract practice is frequently brought against the railroad service in hospital organizations. Could not this same charge be brought against some of our most profound research workers in scientific institutions or the medical man in the United States Public Health Service at Washington, or in the army or navy Service, all of whom are working for a salary, who have brought about such brilliant results at Havana, Panama, and many other tropical cities, and have made the building of the Panama Canal possible, as well as prepared the way for the commerce of the world?

What is there so peculiar in the training and work of the medical man that his services are not to be governed by the same laws of society as those of his fellow man; why should the profession of law, the ministry, architecture, engineering, and in fact all other fields of human endeavor be regulated by one ethical and social code and the medical profession by another? To my mind there is but one reason why medical men have not taken the place in that larger sphere of human activities to which they are entitled, and that is because of an apparent objection on their part to create and keep for themselves a definit field. As a working part of the great industrial world the fundamental reason for this is to my mind based upon a single cause—sentiment. Is it not true that there is hardly a physician in any of the smaller cities or towns that would not appreciate an appointment as surgeon for a railroad?

The charge has also been brought that the surgeons holding railroad positions were of an inferior class. In a canvass of one hundred presidents of county societies in Illinois, one of the questions askt was: "Do doctors in general consider the acceptance of railroad appointments ethical?" Ninety-eight per cent. replied in the affirmativ.

Another question was: "What class of doctors have railroad appointments in your community?" The replies were as follows:

Good	52 per cent.
Best	38 per cent.
All classes	10 per cent.

Another question was: "Are they considered leaders in the community?" Replies were eighty-four per cent. in the affirmativ. Another question was: "Are they Society members?" Ninety-four per cent. replied in the affirmativ.

It would, therefore, indicate that railroads generally select the better class of surgeons and physicians in practically every community.

SOCIOLOGIC.

It is bound to have a good effect upon the morale of the men; a beneficial effect on his family and on the community. The better the man, the better the citizen, the better the citizen the better the community, and every community has its effect upon the prosperity of the state. Is it not a fact that the efficient worker who is able to bring a competent living to his family is enabled better to educate his children and to keep them out of factories at an early age where they are bound to come in contact with undesirable environments during the formation period of character, and thru neglect, remain in the more humble walks of life, all of which tend to contribute to the lowered tone of the community?

The benefits to be derived from the above may be summarized as follows:

The Standpoint of the Employe.

First: He is protected from unethical medical men.

Second: He receives the very best attention where he otherwise might neglect himself.

Third: He is furnisht in general the very best class of surgeons.

Fourth: He has the benefit of consultation and hospital treatment where otherwise he probably would not receive such advantages.

Fifth: He is *assured* hospital treatment.

Sixth: In most cases the disability and time lost is much reduced.

The Standpoint of the Company.

First: Reports are often received which give valuable information for the benefit of the company and the employe.

Second: The surgeons and the employes are more loyal.

Third: They have more skilled surgeons than they would ordinarily have if the care of the patient was left to chance, or to the patient's selection.

Foruth: Men are gotten back to work when they are able, and there is less malingering.

Fifth: The patient is less liable to fall into the hands of unscrupulous lawyers.

THE STANDPOINT OF THE DOCTOR.

First: The pay is sure and prompt.

Second: His position as company surgeon inevitably leads to the acquirement of private patients, both connected and unconnected with the corporation.

Third: He becomes possesst of certain transportation conveniences.

Fourth: The extension of his professional horizon carries with it increast work, enhanced skill and enlarged acquaintance.

Fifth: He has access to X-ray and research laboratories and consultations with the best medical men in the country, thereby protecting the patient and himself, thus enabling him to do better work.

In addition to the above limited discussion of the ways and means for the conservation of life and limb and the general well-being of the railroad employe, there is one other subject which is somewhat irrelevant to the above, but which I cannot refrain from touching upon briefly. It is a matter of great importance to the railroad from a humanitarian, as well as an economic standpoint, and that is the needless waste of life that takes place annually among trespassers, and for which the railroad corporation is in no way to blame.

Is it not somewhat paradoxical that two of the European countries that have been foremost in the passing of laws for the welfare of mankind as to increasing his efficiency and prolonging his life, are to-day engaged in the most ruthless sacrifice of human life?

Does it not also seem that our lawmakers who are so activ in the passage of workmen's compensation acts, with the intended benefits to mankind, are frightfully behind the times when the immense loss of human life takes place from this one cause annually? Nearly every state, county and municipality is overly activ in the passing of laws and ordinances compelling the railroads to elevate their tracks, and to adopt elaborate means of safety appliances, and at the same time they close their eyes to one of the greatest drains on humanity.

Admitting that the agitation of the subject is of comparatively recent origin, it cannot be truthfully said that our lawmakers are ignorant of the appalling facts. That they know the use which thousands of people make of the tracks of our railroads, and also are aware of the danger which such use involves, is demonstrated by the records of a large number of the state legislatures, which clearly show that the law making authority has been approacht repeatedly and the statistics presented. In many of the States no positiv action has been taken to remedy this evil. In the very few instances where legislation has been effected, the statute has been wholly inadequate to accomplish its desired end, as it has been enforced, if at all, in a half-hearted manner. The testimony of the agents who have sought to prosecute trespassers in the courts of law, reveals either total failure or but the slightest success. As the inevitable result of legislativ inaction, the habit of trespassing on the railroad property is growing with leaps and bounds.

We must face the amazing fact that in nine years fifty thousand trespassers on the right of way of the American railroads have met with a horrible death, and few seem to be aware of it—or, if aware, were too busy with their own affairs to pay attention to so hideous a slaughter.

Only a small percentage of this vast loss was comprised of members of the so-called tramp, or hobo class, but was made up of useful young men, women and children who were permitted to sacrifice their lives, bringing sorrow to their homes, with added great expense to the family, of perhaps limited means, and a tremendous expense to the railroads.

To the legislature of Illinois, a well intentioned and temperate, but inadequate statute has been presented, dealing with this tremendous problem. Let us hope that even this will speedily become a law and that other states will immediately fall in line, and that the railways of this country shall be freed from the opprobrium of this slaughter which is all so unnecessary, and for which they should be held blameless.

DISCUSSION.

Dr. Woods Hutchinson, New York:

I am sure we have all been greatly interested in Dr. Hopkins' paper, and I think it is of decided significance as showing the change in the spirit which is coming into modern industry. In the earlier days the attitude of the great employer of labor, of the great corporation, used to be to take the raw human material, grind them up, kill them, throw the scraps away and get new raw material. The welfare, the life and the interests of the working man were of comparatively small importance compared with dividends. Now, this attitude has almost entirely reversed itself. It has been found, for instance, that it costs in the neighborhood of five hundred dollars to make a man a safe and efficient member of a railroad force. The same thing has been found in other institutions employing labor. The longer the individual can be trusted, protected and continued in improvement and in training, the better for the corporation, the better for the individual, and the better for the general public. The public, I know, is not aware of the immense debt of gratitude which they owe to both the railroad men themselves and the men employed as managers, surgeons, etc., of the railroad company.

Another point is that I believe the railroads and some of the other employers of labor have foreshadowed the really sensible relation between the doctor and his patients, that is to say, in a yearly payment, prorating the amount of sickness in the community. The mortality and morbidity rates should be taken as a basis, and the annual fees arranged to cover all emergencies. In that way an attack of typhoid will not be an absolutely disrupting and bankrupting influence in the life and home of a laborer. I am sure that the valuable and interesting systems adopted by the railroad companies are going to be a model upon which arrangements of that sort will be made in ordinary medical practice. We have got to get over the absurd prejudice against contract practice. There is no objection to contract practice if it pays well. It is only that contract practice which does not pay that is undesirable and unethical and all that kind of thing.

Dr. R. W. Corwin, Pueblo, Colo.:

I have been much interested in this paper. I know the good work Dr. Hopkins has been doing and congratulate him on the excellent results obtained under his management.

For thirty-five years I have been chief surgeon for the Colorado Fuel and Iron Company, and during that time, local surgeon for a number of railroad companies. The Colorado Fuel and Iron Company medically and surgically cares for the families of the employes, as well as the employes. It built and conducts its hospital. This, I feel, is better then to employ a general hospital, because the surgeon can control the management of the hospital and conduct the care of patients better than it is possible to do in a general hospital.

In a general hospital it is impossible to have your orders observed as in one under your control. You cannot overcome noises, especially if made by doctors, visiting nurses or members of the board of management. Smoking, offensiv medicines and many other annoyances cannot be prohibited in the general hospital, all of which have much to do toward the comfort and even recovery of the patient. For instance, in our hospital we permit no loud talking, laughing, heavy walking or swishing of skirts from stiff starching, no smoking, and no iodoform. The floors are covered with cork carpet so as to overcome noise from walking. The doors swing thru and close noiselessly. Curtains are arranged so that there is no rattling. They can be taken down and laundered. We have no elevators or stairways. Inclines take their place. The persons weak, old, lame, short or tall, may take steps most suited to their convenience. All of these are conveniences and necessities which aid in a patient's recovery, and can be controlled in a private hospital and not in a public one.

Dr. A. Miles Taylor, San Francisco:

It certainly has been a pleasure to me to listen to Dr. Hopkins' paper. Having spent a quarter of a century of my life as a railroad surgeon, I feel more interested than I would otherwise. The doctor seems to have covered everything that can be said along these lines in the way of advancement in the care of the employes and the passengers injured on the railroad, the sanitary conditions, the benefits to the family, etc. However, I will say that here in California it is the duty of all the surgeons of the railroad company to make inspection frequently of the shops, cars, water supplies, the environment of the employes, and the houses their families live in. Since this system has been inaugurated, sickness has been reduced fifty per cent. in the last ten years.

The doctor speaks also of the well-trained man in the service of the company, which is one of the greatest assets a corporation can have. Train accidents are prevented when the trainmen know every curve, bridge, boggy place, where to look for slides, etc. If we have an untrained man trying to make up lost time, the result may be an accident which may cause a great deal of worry and trouble to the officials, loss of life and limb to the passengers and employes, financial loss to the company, and many other things that are deplorable. All this might be prevented if the company were able to keep trained men in the service, as the doctor has so eloquently stated.

If the employes have health and their minds are not disturbed, they can do better and more efficient work; but, if their families are ill, the children out of school on account of financial or other troubles, they are not in position to give the service to the company, or to the public who patronize the company. It behooves the physician and surgeon of the railroad companies and other industries to see to the health of the families as well as the employes. This can only be done by securing the best sanitary surroundings. It has been my rule, for the past fifteen years, to select the health officer of each county to act as surgeon for the railroad company. In doing so, he has a double duty; he must look after the sanitary conditions as well as the health of the employes. In employing such men we select the best we can get; and, in case of accident or illness, the best is the cheapest, the results are better, and the sooner we can get the men back to work the better it is for all concerned. It is said that railroad surgeons and industrial surgeons in the factories are employed because they can be had at small salaries. That is not true thruout the Western States. In place of the surgeon seeking the position, the company, or the chief surgeon in charge, tries to select the best surgeon procurable; thereby, the position seeking the man.

In regard to the hospital. We have patients who are injured or taken sick given the same service as the millionaire stockholder or the richest passenger injured on the road. There was a time when the passengers received first attention and the employes came last. That time is past. The poor section worker is lookt after to-day just the same as the richest passenger. We have our ambulance service in every city along our line that is large enough to maintain one. They are given instructions to give their best and quickest service. We select the best hospitals for our employes and passengers alike, and we pay the same for each of them. I believe, as Dr. Corwin said, the private hospital is best where you have full control. To-day we have public hospitals under excellent management, the equipment the best capital can produce. The same results and equipment do not always exist in private hospitals. If we demand it, we get absolutely first-class service. We had a private hospital before the earthquake, but since then we have had about as good results in the public hospitals.

Speaking about the malingerer: Dr. Hopkins said he had not had many. I have found that since we have had so much legislation and so many laws past bearing upon the laborer's compensation in cases of injury—the physicians themselves are to blame for some of the laws past because they left it entirely in the hands of the politicians—the malingerers have increast. You dismiss them from the hospital, and the next thing you are called before the "Industrial Accident Commission" to defend your action, as they have gone to some other physician who reports many things wrong. After the trouble the board has been to, the trouble it caused the surgeons, and the inconvenience to all concerned, almost in every instance you simply find him as he was when dismist from the hospital—a malingerer. We have more cases of this kind than before the Workmen's Compensation Act was past. They try to play upon the good graces of the board, who they think do not understand the condition and have not the power and privilege of calling in experts and physicians to assist them in their investigation.

Dr. C. W. Hopkins, closing:

Referring to Dr. Hutchinson's remarks regarding contract practice; there are times when it becomes rather amusing, especially regarding railroad work.

There have been occasions when railroad local surgeons have been brought before the county society charged with doing contract practice. In several instances, where the local surgeon had died or resigned, the man who started the agitation and who was the cause of the local surgeon being brought before the county society, was the first man to send in an application by wire for this man's position. The matter of contract practice seemed to look differently to him when there was a chance of gaining the position for himself.

A short time ago one of our local surgeons was operated upon for appendicitis and died under the anesthetic. He had recently been called before the county society, charged with doing contract practice. I received a wire the very next morning from another surgeon in that town, asking for the position, and learned later that he was the man who had been instrumental in bringing the charges. I decided that the new applicant had the telegram ready to send before the anesthetic was started upon the unfortunate doctor. It is needless to say this gentleman did not receive the appointment.

Regarding Dr. Corwin's remarks with respect to hospitals, I wish to say that of all the hospitals I have ever visited over the country, municipal, private, or owned by corporations, I believe he can be considered the pioneer in establishing what may be called a perfect hospital. I have never been in a more absolutely perfect hospital than the one in Pueblo, owned by the Colorado Fuel and Iron Company, and under the charge of Dr. Corwin. Everything has been done for the comfort of the patient, for good work by the surgeons, plus the most pleasant surroundings, both inside and outside of the building. The doctor has gone so far as to remove all the bath tubs, because he thought a man should wash his head first and his feet last, and for fear that some one would get in the tub feet first, everything for bathing purposes was made into shower baths.

The inclines do away with noisy elevators and stairs and save a great deal of time in doing away with the lazy elevator boy, who is probably asleep at the top floor.

I feel that no one is better qualified to speak along the line of hospitals, their equipment and efficiency, than Dr. Corwin.

Regarding the malingerer, I was much interested in the remarks by Dr. Taylor. There is no one that is such a thorn in the side of the railroad surgeon, or who gives the railroad so much trouble as this type of individual.

There was one rather amusing case with which I had to deal about a year ago. A car repairer was contused somewhat over the shoulder by a car wheel while sitting astride the rail under a car. For months this man went around claiming that he could not move his shoulder, could not dress himself or even feed himself with his left hand. He would not allow you to manipulate this shoulder or carry the arm in any direction. Nevertheless, under anesthesia he would use the left arm and shoulder in any and every direction while going thru the period of excitement, and I was able to handle this shoulder and place it in any position while he was anesthetised. These examinations under anesthesia were made repeatedly, always with the same result. At the same time all electrical tests were normal. This condition of affairs lasted about six months. In spite of the fact that this man was lookt upon as a malingerer, the road gave him the benefit of the doubt and settled with him for the sake of closing the case.

Three days after settlement was made, the local surgeon met him on the street and askt him how he was. He stated that he was "fine." Could use the arm in any direction and gave the doctor an exhibition of his fully recovered motion at the shoulder. Upon being askt what he had done to bring about this early and complete recovery, he stated that he had been to a little town nearby and the village blacksmith there had found a dislocation and had reduced it, and since that time he had been perfectly well. This was in spite of the fact that we had at our disposal all the appliances for diagnosis, such as the X-ray, anesthesia, electrical tests, etc. I have about decided to place this village blacksmith upon our staff to diagnose and correct conditions where we surgeons fail.

REFRIGERATION, TRANSPORTATION AND CONSERVATION OF POULTRY AND FISH PRODUCTS.

By M. E. Pennington, Ph.D., and E. D. Clark, Ph.D.[1]
Food Research Laboratory, Bureau of Chemistry, U. S. Department of Agriculture.

INTRODUCTION.

In these days when so much is heard of our failing meat supply, it behooves us to take account of stock. We should consider the more common and popular substitutes for meat, the outlook for the increast production of these substitutes, and also improvements in methods of handling, transportation, and conservation. The interest in pure food matters and the demand for sanitary products require that this fase of our problem must never be overlookt. It is at once obvious that the main foodstuffs similar to meat are poultry, eggs, fish and shellfish, both of which latter are often groupt together under the name sea-food, forgetting the large production of fish from the lakes and rivers of our Central West. It is surprising to learn that the United States annually produces at wholesale prices about $500,000,000 worth of eggs, $300,000,000 worth of drest poultry of various sorts, and over $100,000,000 worth of fish and shellfish. Among the fisheries, canned salmon is a leading item, being valued at over $25,000,000 in the 1914 season. With the exception of canned, salted and cured products, every one of the foodstuffs we are considering is perishable to a most serious extent, a fact which makes the annual loss from spoilage, due to poor handling and lack of refrigeration, amount to 10 per cent. of their value annually. Egg shells are fragile, and this also adds greatly to our loss on eggs, besides that suffered thru the deteriorating effects of heat.

Eggs and poultry are produced in every state, but it is usually in certain of the central and southwestern states that the supply exceeds the demand in that particular locality. In other words, the great cities on the eastern coast, and to a less extent those on the western coast, must draw their chickens and eggs from far distant places, necessitating long train hauls and expensiv refrigeration in transit. The points of production and packing establishments for poultry and eggs are widely scattered, and in this way offer a contrast to the meat industry, which draws its supplies from a large area but has its packing plants in a few places. In our fisheries, we find the main producing points scattered along the length of our sea coast, lakes and rivers, with the wholesalers selling the fish thru centers like Boston, New York, Norfolk, Pensacola and Seattle. Every year many million pounds of salmon and halibut are shipt three thousand miles from the Pacific coast to the more eastern cities. Large scale oyster operations are mostly limited to New England, Long Island, and Chesapeake districts, with smaller centers on the Gulf and Northern Pacific coasts. As in the poultry industry, the fish and oyster business has been so widely scattered that there has never been the same opportunity for developing standardized operations, use of by-products, and control of the relation of supply and demand, that have made the meat packers so successful. Also, the character and methods of the poultry and fish industries vary greatly with local conditions. Certain markets demand different grades of chickens, just as the nature of the handling of fish has to depend upon their kind and size, as well as upon the trade customs of the group of fishermen and consumers involved. As we shall see later, these local differences are greater in the fish business than in the case of the poultry industry, and very much more so than in the centralized and standardized meat industry.

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[1] Read at the 40th Annual Meeting of the American Academy of Medicine, San Francisco, Sept. 26, 1915.

HANDLING AND REFRIGERATION OF DREST POULTRY.

Formerly chickens were killed to-day and eaten to-morrow, because decay could not be checkt for any length of time. Then, as the farms were pusht away from the edges of the growing cities, crusht ice was used to preserve the drest birds until they could reach the consumer, a matter of a week, perhaps. The people increast in the cities faster, however, than the chickens multiplied on the near-by farms. The hauls soon became too long for farm wagons, and then the railway was called into service. Each year for 20 years or more the railroads have been carrying to eastern and western cities drest poultry from a wider and wider radius. Texas turkeys and Oklahoma chickens are sent to New York and San Francisco.

Good handling of drest poultry necessitates facilities which cannot be maintained by the individual farmer. Drest poultry is now a business by itself, and a great industry has grown up to attend to this work. Therefore, when the farmer's flock has reacht a marketable stage he sells it to the poultry packer, or to his agent. As received by the poultry packers, the fowls are generally hungry and thirsty and are always nervous and tired; hence they are not in condition to be killed. Many of them are thin, because comparatively few farmers feed their poultry enuf to fatten them. The poultry packers have establisht feeding stations where from 10,000 to 30,000 birds, housed in specially constructed feeding batteries, are given clean grain mixed with buttermilk for from 7 to 14 days. The 7-day feeding causes a great improvement in the flavor and tenderness of the flesh and increases the weight. After the feeding period is over the birds should be starved for 24 hours, having a plentiful supply of clean water only. This practice results in almost completely emptying the intestinal tract of foods in process of digestion and of waste products to be thrown off, and has been found to be far better than the practice of eviscerating when the bird is killed.

In the better establishments it is customary to kill the birds by cutting the jugular vein with a slender straight-edged knife, especially constructed for the purpose. Then that portion of the brain tissue which controls the muscles holding the feathers in place is destroyed by a thrust of the same knife, and the feathers are so loosened that they are easily pulled out. The cutting of the blood vessels in the proper way permits the blood to drain out of the carcass until it is practically blood free. This is essential, if the bird is to keep well, and is a part of the process of dressing that is too often faulty. In order to accomplish this bleeding the vessels must not only be cut properly, but the bird must be held head down while removing the feathers.

The up-to-date packer no longer uses ice to remove the animal heat. He has mechanical refrigeration and provides clean insulated rooms in which a temperature of about 32° F. is constantly maintained. The chickens are hung by the feet on racks made entirely of metal. The time required to chill the fowl is usually about 24 hours, and the packer must be sure that the viscera, as well as the skin and flesh, are free from heat before the birds leave the chill room. It is the failure to observe this requirement that is responsible for much of the bad-conditioned poultry in our markets. The range of temperature permitted, too, is small. Below 28° F. the flesh is frosted; above 35° F. decay proceeds too rapidly to permit of long hauls to distant markets. Having removed the natural heat from the drest fowls, the next step in their preparation is to grade and pack in suitable containers for shipment. This operation should be performed in a room having a temperature of 30° F. and in this room the packt boxes may remain for several days while awaiting shipment. Of course, the birds can be frozen hard after they are chilled, and so shipt, and this is a very excellent plan, especially if the haul is across a hot country.

The up-to-date processes of killing, picking, chilling and packing poultry used in the better establishments are gradually being adopted by other houses. Once it was the universal custom to plunge the recently killed birds into hot water to loosen their feathers. This is known as scalding. It is being discontinued because the hot water scalds and loosens the skin so that the pickers necessarily tear it in removing the feathers. These tears, and the partially cookt state of the skin, make it decompose easily, and offer an easy point for the attack of bacteria, thus starting spoilage of the whole bird. When the fowls are killed and bled by cutting the jugular vein and destroying the brain tissue at the same time, a much better appearing and keeping product is obtained, and the picking is made easy.

Formerly, drawn poultry was in demand, but at present the weight of opinion, scientific and practical, is against the evisceration of chickens held for shipping, or for freezing and holding. When the body walls of the birds are cut, and when the entrails are removed with the hand, it is easy to see that the body cavity becomes smeared with blood and intestinal contents. However carefully the bird may be washt and wiped, the bacteria on the surfaces can never be wholly removed. For this reason, both shipping and storage experiments have shown that undrawn birds are not nearly as prone to decomposition as those that have been eviscerated. As we have already seen, it is the best trade custom to stop feeding the chickens in the fattening rooms about one day before killing, in order that the undigested food material may have time to pass thru the birds and leave their intestinal canal practically empty. When such birds are killed, pickt and packt in the proper way, they have an attractiv appearance and keeping qualities that always command a high price.

Until mechanical refrigeration became more common in poultry killing houses, and until the trade came to realize the better quality of poultry which had not been cooled in water, or packt in ice, it was customary to chill the freshly killed birds by immersion in ice water, and to ship in barrels packed with ice. The soaking of the poultry in the water from the melted ice, the dirty heads and feet, and the gradual dissolving out of the soluble parts of the flesh, caused a loss in eating quality and induced decay. Research has shown that ice (wet) packt poultry more readily undergoes decomposition because of its water soakt condition and contamination with bacteria from filth on the feet and so on. It is evident that there are two losses in shipping poultry with ice in barrels: first, the birds soon become immerst in dirty water from the melting ice and absorb a certain amount of water; second, they also lose some of their water-soluble food constituents. The total loss is a resultant of the amount of water absorbed and paid for at the price of chicken, and of the quantity of nutrients dissolved by the water in the barrels. Experiments prove that this total loss amounts to over 10 per cent. of the weight of the original chickens, or a money value of about $400 on each carload of drest poultry. Fortunately, the present tendency in the poultry industry is toward the elimination of wet packt poultry.

FROZEN POULTRY.

Freezing poultry during the season of excess production, and holding it in that condition until the season of shortage arrives, has become a trade practice in the United States. Goods so kept are commonly called "cold-stored," tho it is a difficult matter to draw a sharp distinction between produce which is held for weeks in a chill room, yet is accepted on the market as "fresh," and that which is frozen for transportation or marketing purposes and held, possibly for several weeks, in a frozen state, and goes, therefore, as "storage."

It is very desirable that the poultry which is to be put in cold storage should be dry pickt and dry chilled. Poultry which has been cooled in water shows blistered areas and an unsightly drying out of the skin after comparatively short periods of storage, while the scalded fowls have not only unsightly skins but a deepening of the color over legs and thighs which is very undesirable. It has been observed by the more experienced members of the industry, and confirmed by scientific investigation also, that scalded poultry does not keep as well as that which is dry pickt; neither does the water-cooled product keep as well as that which has been air chilled. Larger packing houses at the present time aim to have not only a chill room, such as has been discust, but also a room maintaining a temperature below 0° F. (—18° C.). In this room the chilled birds in boxes are kept until hard frozen. They may be carried by the packer hard frozen at 10° to 15° F. (—12° to —9° C.) until sold, or they may be shipt, immediately after freezing, to a warehouse which is in proximity to their final market.

It is a comparatively simple matter to keep birds in good condition from one season of production to the next in a well-constructed cold storage warehouse, provided that they are received at the warehouse properly drest, chilled, and packt, and with such promptness that decomposition has not obtained even a slight foothold. Under such conditions the responsibility of the warehouse is the maintenance of cleanliness and a constant temperature which is not above 15° F. (—9° C.), and which preferably should be nearer 10° F. It has recently been estimated by a competent observer that $30,000,000 worth of poultry is frozen and stored annually in this country.

HANDLING AND REFRIGERATION OF EGGS.

The egg trade of the United States involves not only a vast number of people, but represents an enormous sum of money annually. It yields, also, a foodstuff of very high value, which is assuming greater importance to the nation because large meat animals have become scarcer and higher-priced. Many of the difficulties surrounding the production of meat animals do not apply to poultry. Chickens will thrive under widely varying conditions and can be fed a variety of food, much of which would otherwise be wasted on the farm.

The broadcast nature of poultry raising is another important feature. The census of 1910 states that poultry is raised on 87.8 per cent. of the farms of this country, but it does not take into consideration the many producers of poultry and eggs in the towns or city suburbs where the small chicken yard plays a significant part in the egg and poultry supply of the community.

The farmer usually delivers the eggs to the storekeeper or packer's agent by wagon. From these receivers they commonly go to a central shipping plant, which is generally known as a "packing house," and which handles goods in car lots. This plant may or may not be provided with the proper facilities for doing the work assigned it. To reach the packer, however, the eggs generally go by train and in comparatively small quantities, therefore, as "less than car lots," or what is known to the railroad men as "l. c. l's." For such small lots and for short hauls the goods are pickt up by a local freight train. The wait at the station, which is frequently only an open platform on which the cases remain until the arrival of the train, and the haul in the "pick up" freight car, the temperature of which is governed entirely by atmospheric conditions, result in rapid deterioration in summer and sometimes freezing in winter. Often in summer the car becomes an excellent incubator, holding well the sun's heat even in the cooler hours of night, and it is not unusual in the summer months for the packer to be greeted by the cheerful "cheep-cheep!" of newly hatched chicks as the cases are carried into his receiving room.

The progressiv packer, who generally handles poultry, eggs, and butter, is now equipt with an artificially refrigerated chill room which maintains a temperature of 40° F. or a little less in which he keeps his eggs until shipment. If he is wise he rushes the egg cases into that room, stacks them loosely, and chills thoroly before shipping to his market center. He also candles in a room which is chilled, removing rotten eggs and broken eggs and grading according to cleanliness, size, and, to a certain extent, freshness. After the packer has graded and repackt the eggs in boxes holding 30 dozen each, with clean "fillers"—as the little strawboard racks which hold the eggs are called—he ships them to the market center, generally in car lots, or holds them at about 35° F. The packer has a chance to control the temperature of the car, keeping it iced in summer or closing it to prevent freezing if the weather in transit happens to be cold.

Size, cleanliness, cracks and color may readily be determined by inspection; freshness, in the sense of a high quality, firm-bodied egg, rather than in the lapse of time since laying, is determined by a process known as "candling." The egg candle consists of a bright light, generally an electric incandescent bulb, protected on all sides by an opaque shield in which are one or two oval holes a little smaller than the egg. The eggs are prest firmly against these holes and, as the light shines thru, the yolk and white may be seen, as well as the air space at the large end of the egg and any foreign bodies that may be present. In the spring of the year when 50 per cent. of our eggs are produced and the conditions of production, climate, and markets are most favorable for marketing eggs of good quality but little candling is done in the producing section. In the large consuming centers some eggs are candled at all seasons, to insure, as far as possible, the distribution of good eggs only to the best trade. It has been said that climatic conditions have the greatest influence on the quality of the eggs coming to the markets. Too much rain means that the hens have muddy feet, hence the eggs may be soiled even when deposited in clean nests; but when laid hither and yon, in stolen or unkempt nests, as so many farmers permit their birds to lay, the proportion of dirty eggs is greatly increast. Heat, however, is the most prolific source of trouble. Hot weather not only puts the hen out of condition, but it hastens all the evils than an egg is heir to after it is laid. Its flavor is lost sooner; evaporation is hastened, hence the shrunken state comes more quickly; worst of all, the development of the embryo in the fertilized egg proceeds with a greater and greater steadiness and rapidity as the temperature rises, resulting in a large proportion of the "rots" and "spots" of commerce.

In order to preserv the desirable qualities which are found in the new-laid egg until it reaches the consumer the development of the chick must be reduced to a minimum. Germination of the fertile egg begins before it leaves the body of the hen and growth of the chick will continue if the temperature is greater than 68° F., tho, of course, the rate of development is slower if the temperature is below 103° F., the normal incubation temperature for eggs. Nine-tenths of the vast number of eggs that are candled out every summer as unmarketable are fertile eggs in which the germ has started to develop. A temperature of 70° F. will start the germ in a fertile egg to slowly developing. A fertile egg, subjected to a temperature of 100° F. for forty-eight hours, will be unmarketable, while an infertile egg may be subjected to the same temperature for a week and still be perfectly good for cooking purposes. The simple expedient of shutting up or disposing of the adult male birds as soon as the hatching season is over, if it should become the general custom, would result in the saving of a million dollars' worth of eggs every season. In the Middle West, a slogan "Swat the rooster" has become popular and is successful in limiting the number of fertile eggs and, consequently, preventing large losses from the spoilage of eggs thru incubation.

COLD STORAGE OF EGGS.

The preservation of eggs has for centuries been a problem, since eggs, probably more than any other food staple except fish, are dependent upon seasons and conditions for production. In the temperate zone the sequence of seasons results in the production of a large proportion of the whole year's lay during the spring months. In the winter months the production, as compared with consumption or demand, is extremely small. Hence the necessity of preserving eggs from April until December in a wholesome condition, retaining as much as possible of their freshness of flavor.

Of all the various methods for the preservation of eggs, cold is, so far, the best. Its application to the keeping of eggs, however, must be along definit lines. As has been stated when discussing the application of refrigeration to the marketing of poultry, it is efficacious in maintaining high quality for a reasonable period of time if the eggs are put into the cold room in prime condition. Cold does not make them better, whether of low or of high grade, and when deterioration has already begun cold does not retard the process to the extent that it does when the eggs are fresh. The use of cold, therefore, as a preservativ of eggs depends very largely for its success upon the condition of the goods when they come to the cooling room or the storage warehouse. The range of temperature used in the handling of eggs, however, is very small by comparison with that commonly used in handling poultry and temperatures low enuf to freeze the eggs, even superficially, are disastrous.

Artificial refrigeration is more extensively used when eggs are to be kept for the season of shortage than for the preservation of high quality and the prevention of deterioration during routine marketing. Happily for the consumer, however, the industry is beginning to recognize the value and importance of keeping eggs cold thruout their entire journey from the hen to the table; happily, too, for the industry, since the application of practical chilling methods will in a large measure wipe out the losses which are now so prevalent.

According to trade practices, storage eggs are graded in the early part of the laying period by size and cleanliness, packt into a rather heavier filler than is used for current consumption, and stored in odorless wood boxes, 30 dozen to a box, at temperatures ranging from 29° to 32° F. (—2° to 0° C.). The questions of temperature and humidity and cleanliness are of great importance in the successful cold storage of eggs. The temperature must not permit freezing of even the most superficial kind, yet the colder the eggs can be kept without congelation the better. Fresh eggs which are thick bodied, as laid by well-fed hens, can be held advantageously at 29° F. (—2° C.); on the other hand, thin eggs, or those which have begun to deteriorate, may require 32° F. (0° C.) for safety. It is scarcely necessary to say that the latter will not keep as long as the former. A constant temperature within small limits in long storage is an absolute necessity. Humidity in egg keeping is a subject which is much in need of close scientific investigation. It would seem, from the experience of the industry, that the desired relativ humidity of the atmosphere is variable and depends to a certain extent, at least, upon the construction of the storage room, the quantity of eggs stored, and the environment in general. Temperature and humidity must always be kept adjusted so that moisture will not deposit on the surface of the eggs. This is known as "sweating" and causes rapid deterioration by encouraging the growth of bacteria and molds. Every effort is made to keep the egg-storage rooms free from odors, no other commodity being allowed in the same room. A plentiful coating of lime over wooden surfaces, freshly applied before the eggs are received, is the most common method of keeping walls and floors odorless.

The statement that a cold-stored egg is as good as an egg just from the hen is never true. An egg is best when newly laid. Every day causes a loss in eating quality. When environment is bad, one day may render an egg unfit for food; when environment is good, weeks will make so little change that only an expert taster can tell the difference. The length of time that eggs can be kept in cold storage depends very largely upon their condition when they enter it. As already stated, eggs laid early in the season during cool weather keep best. Carefully graded, packt, and transported, such eggs are good food at the end of nine months, when held at 29° to 31° F. in a properly managed storage plant.

The unfairness in handling cold-stored eggs comes from the retailer who usually does something like this: The very large, clean, best-order eggs are sorted out as "strictly fresh," the next most desirable as "fresh," and so on with prices ranging accordingly. In order to sell these for what they were not, a mistaken impression of all stored eggs is given by calling the worst eggs in the shop "cold storage." Every man who handles those eggs knows they are cold stored and pays a price in accordance with that fact, except the consumer. The consumer, partly because of ignorance concerning the season of egg production, partly because of prejudice against all cold-stored eggs for all purposes, has allowed the retailer to trade upon his ignorance and prejudice to the great betterment of the retailer's pocketbook. Fortunately, the consumer is beginning to realize more and more that when properly controlled and managed cold storage is a stabilizer of trade in perishable foodstuffs and that it alone makes available many necessities and delicacies of the table in seasons when nature does not provide them.

FREEZING AND DRYING EGGS.

There are three widely used methods of holding eggs for a later consumption: First, storage in the shell under artificial refrigeration at temperatures ranging from 29° to 31° F.; second, the contents are removed from the shell, the liquid placed in cans, frozen solidly and held in a frozen condition until used; third, the liquid dried and later dissolved in water at the time of using. The methods of handling and refrigerating eggs in the shell have already been outlined, and now a little may be said of the business of preparing frozen and dried eggs for the market. Of course, eggs in the shell cannot be hard frozen without breaking the shell and ruining them for sale. However, after breaking and removal from the shell, eggs may be hard frozen and transported or stored in this condition for many months. Frozen and desiccated eggs have provided an outlet in the producing section for small-sized, dirty and slightly stale eggs which can be held frozen or dried for many months until needed for baker's use. Such advances have done much to increase production and to effect economies in eggs as a food. Under present conditions, such small, dirty or crackt eggs are not worth shipping to distant markets during the season of production, but are highly desirable if held in an unaltered condition until winter time. Eggs which have become slightly stale frequently deteriorate during the haul to market to such an extent that they are unfit for human food. Eggs of the foregoing grades do not keep well if cold-stored in the shell. Hence they are released from the shell when fresh, placed in tin cans and immediately frozen.

When eggs are removed from the shell in the most sanitary manner in clean breaking rooms, under almost surgically aseptic conditions, they can be frozen to give a most valuable form of egg preparation for bakers and chefs, to use in cakes and so on. These broken eggs may be used for all purposes where it is not necessary for the egg to appear in its unchanged form of white and yolk. Girls in white working clothes and caps break the eggs one by one, discarding those which by appearance or odor give evidence of being unfit for food. The skill of these girls in breaking and judging eggs is astonishing. The broken eggs are placed in large cans containing about thirty pounds, and are frozen, after which they may be easily stored or shipped in these containers. In some cases, whites only are put in a can to be used for making icings or "angel cake," in others just yolks are placed, and in still others, the whole mixt eggs. There is nothing more perishable than the broken eggs when thawed, so they are shipt in refrigerator cars under heavy icing and salt, like meat.

Eggs in a dry form are more stable than in the shell or hard frozen; hence they can be used on ship-board, in tropical climates, in the far North, and wherever stability and decreast bulk and a lack of refrigeration are important considerations. After removing the egg from the shell with all the precautions pertaining to the preparation of eggs for freezing, the well-mixt liquid is evaporated by heat in various mechanical appliances until only about 10 per cent. of water remains. Generally a flaky powder results. Yolks of eggs and whole eggs are dried in this country, while dried egg white is made in central Europe and China. Adding water to dried eggs makes then into a preparation like broken eggs, which may be used for cooking in the same way.

HANDLING AND REFRIGERATION OF FISH PRODUCTS.

We have scarcely begun to utilize our fisheries, while the possible development of poultry raising and egg production is a common topic in the popular press. The supply of fish, on the other hand, is literally in sight and may be had for the catching, a process which requires some capital and trained labor, but which is infinitely simpler than the hatching, feeding, housing, and slaughtering involved in poultry raising or the meat industry. One of the greatest difficulties in the way of utilizing our fisheries resources is the ignorance of the American people, especially of the nativ-born, well-to-do people, in regard to the kinds of food fishes, their desirability as foods from the viewpoint of both nutriment and palatability, and the methods of cooking which tend to enhance their food value. Whereas we have done comparatively little to stimulate our fisheries, the older nations have expended, and now are expending, every effort to gather the crops that the waters yield so abundantly, and to deliver them cheaply and in prime condition to their people, not only along the coast, but to extreme inland towns. We have not only our great length of Pacific and Atlantic coasts, but we have also the Gulf of Mexico, rivers, and Great Lakes, sources from which our inland territory may readily be supplied. These waters are practically inexhaustible, if fisht in an intelligent way.

A consideration of the various methods used in catching fish is a fascinating thing, but at this time we are concerned with fish production only as it influences handling and refrigeration. When fish are caught in deep lakes or in the ocean, they are taken either with baited hooks or with seines carried around schools of fish by men in small boats. From Boston there are several steam trawlers operated, which make their catches in nets dragged on the bottom of the ocean on the various fishing banks; also, many fishing boats carrying dories from which the men fish with hooks, bring cod, haddock, etc. Where the fish are transferred to a larger boat before being brought to shore this boat often has trips of several days' duration. Therefore, the fish are cleaned and washt to remove blood, and are then packt in the hold in crackt ice. When the fish are caught in seines, gillnets, or traps near the shore, they are generally landed and then cleaned and packt in fine ice for shipment as fresh fish, or else cleaned, washt and frozen for storage and subsequent sale. The cleaning or "gutting," as it is known to the fishermen, is a simple process in which a long incision is made in the fish and the entrails removed. It is customary not to clean certain fish like red snapper, mackerel, shad and herring, while others, like blue fish, cod, haddock and halibut, are nearly always so treated. Cleaning is necessary to secure good keeping qualities in many fish. On the Pacific coast, the staples, halibut and salmon, are usually cleaned, washt and packt in ice, or frozen at once for subsequent shipment to far distant points.

The most important fish in any market are usually those from nearby points, and are generally shipt to the city packt in ice. Most fresh fish are shipt with ice in barrels holding about 250 pounds, with burlap covers, and with holes in the bottom for draining off the water from the melting ice. However, certain fat and tender fish like mackerel and butter fish are shipt in ice water in tight barrels, because the hard ice would damage the stock during transit. More and more fish, especially in the Central West, are being shipt with ice in boxes holding from 150 to 200 pounds, in which the top side boards are extended on each end to make handles and to prevent setting the box on end or in any other position except the upright one. The Pacific halibut and salmon are iced and shipt all over the country in large standard boxes holding about 400 and 150 pounds, respectively. Fish are iced and usually shipt by express when over a day's run from the market, while for shorter hauls the freight or boat service is used. Since fish are provided with a natural waterproof skin, and spend all their lives in the water, the arguments against the shipment of wet packt poultry do not apply with equal force to the shipments of fish with ice.

When possible, fish are iced and shipt for sale as fresh fish because the prices obtained are higher than for frozen stock and the expense of freezing and boxing is thus avoided. It costs about one cent a pound to freeze, box and store fish for the first three months, and this is a great addition to the cost of production in many cases. In the Gulf and Florida districts, fish are all shipt in ice, because during the winter season the demand for fresh fish in the northern cities creates high prices for fresh stock, as little of that kind can be obtained in the home waters. It is easy to see why fish will be shipt and sold in the fresh condition at fresh fish prices as long as it can be done. Often, however, the runs of fish are so great in the summer in northern waters that the markets cannot absorb all the supply. Then is the time when fish must be frozen and held for the off season when there is a demand for summer varieties of fish and none to be had in the fresh state.

FROZEN FISH.

The freezing and cold storage of fish is a matter of necessary conservation more than in any other industry, because fish have such specific seasons of plenty. Also, they have the ocean in which to roam, often giving the slip to the watchful fisherman. The fish business is a succession of glutted and bare markets, of very high and very low prices, so were it not for the supply of frozen fish acting as a balance wheel for the trade, we could buy mackerel at a low figure when plentiful in their short season, and none at any price during the rest of the year. Man can control the supply of meat-producing animals, but over the strange migrations and movements of fish he has no power and little knowledge. He must take the fish when they come, for he cannot hold and fatten them like cattle for a rising market.

Any objection to frozen fish would vanish at once if the process of freezing, glazing and storing were better known. To insure a fine grade of frozen stock, the better freezers are now being erected as near the traps or boat landings as can be done conveniently, and the fish are sometimes carried from the boats into the freezers by conveyors. Usually, as soon as possible after being caught, they are gutted (that is, the entrails removed), thoroly washt and laid in shallow pans, heads and tails alternating, until a full pan of 35 to 40 pounds is obtained. These panned fish are then placed on the icy pipes of the freezers, usually at a temperature of below 0° F. After from 12 to 24 hours the fish have frozen solid and form a large cake, held together by the freezing of the thin layer of water between the individual fish when they were panned. By allowing water to run on the bottom of the pan and cause slight melting, this cake is then easily removed from the pan. Larger fish like halibut and salmon are frozen separately and not in pans. If the fish were stored in exactly this condition they would shrivel and turn white, owing to the loss of moisture which evaporates even below freezing temperature. This sort of deterioration is prevented by an ingenious process known as glazing with ice, this being accomplisht by dipping the blocks of frozen fish into water, thus covering them with a thin film which freezes at once in a cold room and forms a crystal-clear glaze of ice like a transparent varnish. It is easy to see that this glaze hermetically seals and prevents not only loss of moisture from the frozen fish, but also prevents the entrance of the outside air, which tends to make rancid the easily oxidized oils in the fish. Oily fish or those having no scales, like mackerel, salmon and bonitas, etc., do not take a permanent glaze easily, and for high grade stock such fish are wrapt in a semiparchment paper as well as glazed with ice. Glazed fish may be kept boxt, as is usual in most states where cold storage laws require that the date of entering cold storage be stampt on the package, or else are kept loose in a cold room at 7 to 10° F. for months. When boxt, frozen fish may be shipt any distance in refrigerator cars. The humidity of storage rooms cuts little figure in fish storage, and the temperature is kept at a point that provides sufficient lee-way for a rise in temperature, in case there is any break in the refrigerating machinery of the plant.

The preservation of fish by freezing, glazing and cold storage is a process wonderful for its efficiency and simplicity. The preservation of foodstuffs by canning, salting, or pickling always involves the use of heat and consequent destruction of flavor, as in canning, or else the addition of smoke, salt or vinegar in the other type of product which, of course, has an entirely different flavor after such treatment. Frozen fish stand alone as a food preserved by encasing in a thin, hard envelope of ice, which needs only to be melted to give us back our summer fish almost unchanged in flavor.

It is evident that fish will be frozen only when the supply is great enuf to cause low prices in the consuming centers, and also low enuf so that the producer can afford to freeze and carry stock for the higher prices obtained later in the year. Also it is plain that the process of freezing, glazing and storing fish for consumption during the seasons of scarcity is sanitary, efficient and desirable, provided that the fish are frozen at the producing points as soon as possible after being caught. It must be admitted that, in the past, freezing fish has sometimes been used as a salvage process to save from loss those which had been held as fresh stock but had not been disposed of as such. Freezing or cold storage necessarily cannot *improve* any perishable product, but under the best conditions such perishables may be held many months with very slight alteration from the state in which they entered cold storage. The whole matter may be summed up by saying that the proper freezing and storing of high grade fresh fish will produce an article that is good and nutritious food at the end of many months. The people interested in the fish industry understand this perfectly and most of them are now making every effort to freeze only the best of fresh fish for supplying the demand of their winter markets.

Naturally frozen or "winter caught" fish should be mentioned in this connection. On the small lakes of our Northwest and in Central Canada many fresh-water fish are caught in winter thru the ice by hooks or nets and frozen by cold air. Such fish can be recognized by the twisted appearance of their bodies and often by their erect fins caused by their being frozen instantaneously on the ice. In the Maritime Provinces large quantities of smelts are caught in seines and frozen naturally in this same way. As this winter fishing is done when the temperature is below the freezing point, sometimes at —40° F., the fish are frozen almost immediately upon their removal from the water. They are boxt and held on the ice until hauled by teams to the refrigerator cars, and thus shipt to cold storage plants in cities. The unparalleled freshness of these naturally frozen fish, even after months of storage, is a strong argument for the installation of fish freezers as near the source of production as possible.

SHELLFISH INDUSTRIES.

Each year the United States produces many million dollars worth of shellfish, such as oysters, clams, lobsters, crabs, shrimp and scallops. The two main oyster districts are the New England and New York waters in the North, and Maryland and Virginia waters in the South. Oysters are being produced in considerable quantities in the Gulf, and extensiv new beds have been located on the Texas coast. The Pacific coast produces a small oyster of its own which is marketed there along with the eastern form. Carloads of young seed oysters are shipt west to be transplanted in the Pacific waters and later sold when they have matured and reacht marketable size. For some reason, transplanted Eastern oysters will grow in the Pacific, but do not appear to reproduce there. Clams, both hard and soft, are taken in New England, New York and New Jersey primarily, and they, together with oysters, make up the greater part of the shellfish industry. Small and medium sized hard clams are known as Little Necks and Cherrystones, respectively, and are eaten on the half shell. The larger hard clams comprise the stock sold for frying and for making chowder. The soft or long clams find a market for steaming purposes; steamed clams being a popular dish in several of the Atlantic coast cities.

Lobsters are consumed in large numbers in the United States and are generally shipt alive in crates, by boat, from Maine and Nova Scotia ports to Boston and New York for distribution. These valuable crustaceans were once common in New England waters but have been nearly exterminated by overfishing and polluted waters. However, lobster fry planted in the northern districts are beginning to yield more good lobsters. Hard and soft crabs are produced in places from New York southward, the center of the soft crab business being on Chesapeake Bay, especially at Crisfield, Md., where as many as five carloads of live soft-shell crabs are shipt out on the evening train northwards. Hard crabs are usually cookt by boiling or steaming, the crab meat being pickt out by hand and packt in cans, which are shipt in crackt ice. Scallops as eaten are merely the adductor muscle from the mollusk of that name. The shells are opened and this muscle cut out for food, the rest of the animal being thrown away. Scallops are shipt mostly from Cape Cod, Long Island and more southern points in small boxes or kegs.

It will surprise many people to know that practically all of the oysters in Northern waters are cultivated artificially. Cultivation means that the young oysters are allowed to make a "set," or to attach themselves to empty oyster shells on the bottom. Then these seed oysters are transplanted by dredging and laying down in other more favorable places. Sometimes, to encourage good growth, the oysters are taken up and laid down several times before they reach a marketable size in about four years. On the other hand, most of the oysters of the Chesapeake district are dredged off the natural beds during certain months prescribed by law. It is said that the meats of the northern oysters coming from colder water are firmer and make better stock for shipping to distant markets like Chicago and St. Louis, where a higher price is paid for the so-called New York or "northern stock." Oysters are shuckt by hand, washt to remove slime and sand, measured, and placed in one, three or five gallon cans. In the South, these cans are either placed in barrels with crackt ice, or each large can is put in a small square box with room for crackt ice. Car lots go to the Middle West in refrigerator cars, either by express or freight, from both northern and southern points. Northern shippers fill refrigerator cars with hundreds of bare cans of oysters, and then place a layer of crackt ice over the top of these cans, besides icing the car as usual. Refrigerator cars used for shipping oysters are not salted, as well as iced, like meat cars, because of the danger of freezing and thus destroying the quality of the stock, if the temperature goes below 28° or 29° F. Oysters on the half shell have to be considered, but they are a luxury because of the cost of selecting and serving fine stock on crackt ice. However, many oysters in the shell are transported during the cool months, packt in barrels, which are headed up or covered with burlap tops. Obviously, shuckt oysters are cheaper to ship and are more easily handled in cans than are the barrels of shell stock consisting in great measure of heavy, useless shells.

When oysters are taken from the ocean and placed in brackish water, they absorb water and increase in volume, this process being known as floating. The flavor is certainly not improved in this way, but the bulk is increast, thus making it a profitable operation. The federal government, sometime ago, ruled that floated oysters constitute a food adulterated with water, which the consumer buys at oyster prices. The floating process as such has been discontinued, but the *prolonged* washing of shuckt oysters gives much the same sort of increase in volume. Moreover, it is illegal to ship shuckt oysters with ice floating in them for refrigeration, because they would absorb the fresh water from the melted ice and increase in size. Shuckt oysters are now kept cold by ice from the outside of the cans, and a better flavored product is obtained. These federal laws do not affect the retailer, who often adds water to his oysters to increase their bulk and give them a plump appearance. Some cities, like Philadelphia, prefer floated oysters because of their plumpness, rather than the salty flavor of the natural oyster. Scallops have been shipt in kegs with fresh water, which was absorbed in transit, producing an increase in volume similar to that in the case of oysters. This practice, too, has been declared illegal for interstate shipment, and will probably soon be abandoned. Scallops which have been shipt dry are smaller, but have a much more attractiv flavor than stock which has been treated with fresh water.

The federal and several state governments are now making extensiv sanitary surveys of oyster beds with a view to locating any possible contamination with sewage from neighboring cities. The vext question of whether oysters may produce typhoid fever or not is still undecided, but an ordinary regard for cleanliness demands that filth shall not touch human food, whether in the water or on land. Oysters having over a certain number of bacteria of the intestinal type may not be shipt in interstate commerce, and also certain states forbid the sale of oysters from beds found by their experts to indicate possible contamination. The floating of oysters and the addition of dirty ice for cooling them once lowered the sanitary standard of oysters, but this is uncommon; they are now a very wholesome and desirable food. Fresh oysters properly packt and iced may be shipt long distances, even as far west as Denver, and still be palatable if sufficient care is taken.

TRANSPORTATION OF POULTRY AND FISH PRODUCTS IN GENERAL.

Essentially the transportation of commodities adds to their value by the act of taking them from the locality where they are produced to the place where they are consumed. The time that is required in transit is not an important factor in the transportation of coal, lumber and similar things, which are not affected by temperature or weather conditions. On the other hand, it is easy to see that perishable commodities like meat, eggs, fish, fruit and vegetables must not only be moved, but they must be moved *rapidly*, and at the same time, be protected from heat in summer and cold in winter; this is the function of the insulated refrigerator car. In some cases, like bananas shipt northward from New Orleans, the refrigerator cars start their journey with ice in their bunkers, and arrive at the northern points artificially heated by alcohol or oil stoves.

In the case of poultry, eggs, fish and oysters, it is the effect of heat that is most feared, so refrigeration is applied. To maintain refrigeration between the far distant source of supply and the consuming center, we have developt a system of refrigerated carriers in connection with our transportation lines, and we are as dependent upon them for our perishable food supplies as is England upon her ships. The traveling public everywhere is familiar with the appearance of the outside of the freight car which bears the word "refrigerator," as well as the initials of its line, but few know anything of its construction, or its function in our transportation system. There are over 100,000 refrigerator cars in the United States, slightly over half of which are of private ownership, like Armour and Pacific Fruit Express cars. It will surprise many people to learn that somewhat like the owners of Pullman cars, these refrigerator car lines usually receive about a cent a mile per car from the railroads which haul them. In its simplest terms, a refrigerator car is an ice box on wheels with layers of felt or similar insulating material in its walls, and receptacles or bunkers on each end for holding several tons of ice, which is put in thru hatches on the roof of the car. The cars are re-iced in transit at various so-called icing stations. Salt is almost always used with the ice in meat cars, often with drest poultry, in order to make sure that the commodity is not at any time warmed above the point at which decomposition is rapid. Poultry and eggs are shipt from the Middle West in refrigerator cars; halibut and salmon from the Pacific; oysters from Long Island; apples from Oregon; oranges from California and Florida; peaches from Georgia; cantaloupes from Colorado. So great is the present demand for perishable commodities of all sorts, and so great is the distance of the cities from points of production, that our present well stockt markets are wholly dependent upon the refrigerator cars and fast freight service.

TRANSPORTATION OF DREST POULTRY AND EGGS.

In the discussion of the handling of poultry and eggs, they were left in the cold room of the plant awaiting the arrival of the refrigerator car which is to take them to some eastern or far western point, usually over a thousand miles away. It is heat that we must guard against when these products are shipt. So the careful packer asks the railroad to place the iced refrigerator car on his siding at least 24 hours before he expects to load, for no packer who is properly interested in preventing decay ever loads his goods in a car having a high temperature, or hauls chilled goods in open wagons if he can help it. The loading of a car containing 20,000 pounds of poultry or eggs can be accomplisht in thirty minutes if the work is well planned. It should be done as expeditiously as possible to prevent a rise in temperature of the air in the car. Even with prompt loading, it is well to have a very heavy canvas curtain hung in the door of the car to keep the outside air from entering, and only one door is ever opened at a time to lessen the danger of circulation of warm air.

Having loaded the car and again observed the temperature, that the packer may know exactly under what conditions his goods start on a long journey, the door is closed and sealed. The railroad agent knows the perishable character of the freight, and he issues instructions to ice while in transit, that low temperatures may be maintained. Drest poultry should be shipt at from 30 to 35° F. to insure arrival in first class condition. Frozen eggs in cans are extremely perishable, and they should also be kept at below 30° F., the same temperature as frozen poultry. Eggs in the shell may be shipt at 40° F. and no salt should be used when icing the cars, for fear of freezing and ruining the eggs. The condition of the car is determined before loading by means of thermometers, which give the temperature at different points within the car. The manner of stowing the boxes of poultry has a great deal to do with the circulation of the cold air from the ice in the bunkers. The best plan is to load so that there are spaces between the boxes lengthwise of the car, and to be sure that the boxes are not loaded too close to the bunkers for fear of preventing free air circulation. When poultry is shipt packt in barrels with ice, such care in loading is not necessary as the ice itself provides refrigeration.

The fragility of the egg shell makes another serious problem besides that of refrigeration, for the shipper of eggs and for the carrier who has to pay claims for damages caused by breakage in transit. Each case of eggs consists of thirty dozen, each egg being in its own compartment made by the straw board filler, and looking very secure in this position. However, the bumps received in loading and those due to the starting and stopping of trains, together with those received in unloading, all help to break the shells. In loading a car of eggs the cases must be stowed with two objects in view; one to prevent breakage by the shifting of the load, and the other to secure air circulation and consequent refrigeration from the ice bunkers at each end of the car. Research shows that breakage in transit may result from improper arrangement of cases in the loading and improper bracing and buffing. The bracing consists of boards or small pieces of timber nailed in among the egg cases to prevent shifting, while the buffing of lumber or straw is used to take up the excess space between the cases themselves, and between the cases and the car walls. Naturally, much straw would have to be used and greatly comprest in order to make it efficient for this purpose. Rough handling of cases and the custom of walking on them after loading are two forms of damage that only personal instruction will prevent. Thru the co-operation of the government, the shippers and railroads, all these matters have been discust and already the greater care in handling, stowing and bracing have made great reductions in the amount of eggs damaged in transit.

TRANSPORTATION OF FISH AND SHELLFISH.

There are two ways in which fish are transported; one is by express and fast freight for fresh stock, and the other is by freight for frozen fish. When in the frozen state, eastern fish are shipt in wooden boxes holding from 150 to 200 pounds, in which the cakes of frozen fish were placed for cold storage. These shipments of frozen stock are made during the cooler weather in refrigerator cars and under such conditions fast railroad schedules are not necessary. Unlike eggs, fish either frozen or fresh cannot be broken during transit, nor are the frozen fish liable to great fluctuation of temperature, because they maintain their refrigeration, being in large masses, packed in boxes, and coming from rooms as cold as zero degrees. Fresh fish are packt for express shipment either in barrels or large boxes filled with crackt ice, which slowly melts and drains thru the bottom of the container. Fresh fish under ice may go by express either in ordinary or in refrigerator cars. Between Maine and Nova Scotia ports to Boston there is an extensiv business of transporting iced fish by boat service. This is also true to a less extent between Boston, New York and other Atlantic coast points. In certain of the ocean steamers and those running between Alaska and Pacific coast points, there are refrigerated compartments for fish and other perishable commodities. During all the year an enormous quantity of fresh halibut and salmon is sent in refrigerator express cars, packt with ice in large boxes, to the farthest parts of the country. From the Pacific to Atlantic cities the run is made in five or six days, and the express charge adds about three cents per pound. Frozen halibut and salmon travel in the cooler weather in refrigerator freight cars, taking from two to three weeks for the trip at an expense of something over $1^1/_2$ cents a pound. Considerable quantities of iced fish are shipt from Boston and San Pedro, etc., in all directions, by the electric express service furnisht by the suburban trolley lines radiating from these cities. For the first and second zones of the parcel post system, this mail service may prove useful in carrying fish during the cooler weather, if some sort of odorless, waterproof container could be devised so that the fish would not damage the other merchandise.

Live oysters in their shells are shipt in barrels, as already mentioned, and require no refrigeration during the relatively cool weather of the oyster season. During shucking, the shell, which is the protectiv covering of the oyster, is removed, and they thus become an extremely perishable commodity like broken and frozen eggs. Cans of shuckt oysters are as easily handled as cans of frozen eggs, but like the latter, require very efficient refrigeration during transit. Chemical research has shown that the lower temperatures greatly retard the deterioration in oysters. Hence, it is evident that adequate refrigeration will prevent losses on oyster shipments. At present, most car lots and smaller lots of shuckt oysters are shipt west by express from the New England and Chesapeake cities. When the cans of oysters are sent in car lots, they are previously precooled by holding for some hours in the chill room and are then packt into refrigerator cars and over them a layer of ice is scattered, and the car is sealed for its journey of something over a day if by express to Chicago or St. Louis, or over two days if by fast freight to these cities. When smaller lots are shipt, the cans are packt in boxes with ice and are re-iced by express employees in transit. By fast schedules and comparatively low rates the express companies have obtained most of the shuckt oyster business from the railroads, whose freight service lacks the speed of the express, except in certain cases where the railroads run their fish cars from the Pacific coast to Chicago on passenger trains and charge about twice the usual freight rate.

PERISHABLE FREIGHT SERVICE ON THE RAILROADS.

Before leaving the subject of the transportation of poultry and fish products, something should be said of the way in which the railroads handle the enormous traffic of perishable freight in refrigerator cars on fast schedule. These cars are generally iced and salted 24 hours before they are expected to be loaded by the shipper and are then set on his siding. Before loading, the temperature of the center of the car should be below 40° F. To maintain this low temperature only one door is opened and the loading is done thru a canvas curtain hung in the open door. These precautions are necessary to prevent the escape of the cold air in the car. As soon as loaded, the doors are closed and sealed, the car not being opened again on its long journey. The ice bunkers, of from two to three tons capacity, are filled thru the hatches on the roof of the car. Each car is hauled to the next place where others are waiting, and soon enuf for a train are pickt up, and then from some central point a thru train of refrigerator cars is made up of them. Less than car lot shipments are pickt up from place to place and are finally collected at a transfer or concentration station, where they are made into car lots, loaded in cold refrigerator cars and combined with other similar cars to make a perishable freight train. Such trains of perishables run thru to destination, if possible, without being broken up, and have a schedule averaging about 18 or 20 miles an hour. Also, such trains are given preference over other freight, and to avoid delay, are kept out of switching yards at all division points, as far as possible. Meat trains are given the right of way over all other freight, and then come the "preference" or "time freight" trains noted above. On some roads, these trains have a distinguishing symbol consisting of a red ball or a red cross, and this easily discernible mark appears on the destination cards tacked on the sides of the cars. This enables every employee to know the perishable nature of the load in that particular car, so that he may use every means to expedite its movement. In making up such trains, only enuf cars are added to equal about 60 per cent. of the tonnage rating of the locomotiv assigned to that train, thus making certain that there will be no delay on the road. Trains of perishable stuff travel on a schedule as definit and as fast as some of the passenger trains. No stops are made except at division points to change engines or at icing stations where several tons of ice are delivered to the bunkers in each car in a very few minutes, often by a conveyor system. On the receiving end, these cars are rapidly delivered to the consignee, or else placed in terminals or piers at his order. Sometimes cars are diverted in transit, when the owners of the load have reason to believe that better prices may be obtained at some other than the original destination. It is easy to see that during a dull market the consignee may wish to hold his perishable goods in the refrigerator car as long as possible, and so avoid the expense of carting and placing in refrigerator rooms. Naturally, this tends to make a congestion of cars in certain places at certain times, and the railroads make a heavy demurrage charge on refrigerator cars, in order to discourage this tendency on the part of the consignee to use refrigerator cars as storage warehouses.

By a new arrangement, the railroads quote a rate for perishables which does not include initial icing or re-icing in transit, this being paid for by the consignor at a given rate per ton. During the warmer months, both the express and the freight rates often make an allowance of from 20 to 25 per cent. of the gross weight on smaller shipments when ice is used for purposes of preservation, as in the case of barrels of fish shipt with ice, and so on. The rates for refrigerator express service are often high, as these cars often run on passenger trains, thus giving the shippers the maximum promptness of movement; also an attendant sometimes goes with express cars to provide for re-icing in transit, etc. The rates of both freight and express services, and their icing charges are regulated by the Interstate Commerce Commission, so there is not so much a competition of rates in these days as a competition in service, such as providing well insulated cars, fast schedules, terminals near the market district in cities, etc.

CONSERVATION OF POULTRY AND EGGS.

Among the many problems now facing municipalities none is more fundamental to peace and prosperity and none is more complex than is the question of the food supply. To the person trained to observe and eliminate waste, the spoilage of foods between the producer and the consumer assumes the proportions of a public calamity. Also, to a person so trained, good handling, beginning at the source of production, refrigeration during transportation, and, finally, refrigeration at the market with distribution expedited by adequate facilities for the work to be done, means not only the saving of vast quantities of perishable products that are now absolutely wasted, but an improvement in quality of all grades, even what are now the best.

In the poultry packing industry, the best practices in handling and transportation result in a great saving of foodstuffs formerly lost before reaching the market, and also result in a higher grade product on the retailer's stand. This is true conservation. The wider adoption of the most sanitary and careful handling means a great money saving to all the people. The time is coming —and coming faster than a cursory observation would indicate— when the dirty, watersoakt, half decayed, wet packt chicken will be a thing of the past. Indeed, the dry packt chicken of to-day, generally handled for prompt marketing between 30°–40° F. will be hard frozen twenty-four hours after killing and so shipt to market and so carried, even to the kitchen of the housewife, who will thaw it in her own refrigerator before preparing it for the table. Some of the more progressiv packers are refusing to ship drest poultry in warm weather unless the customer will take it hard frozen. Very often the customer dealing with the packer prefers it so, but he is handicapt because the consumer insists that it is "cold storage" and demands a "farmer's chicken that is fresh"—and she gets the thawed companion of the frozen bird, which may have deteriorated in the hands of the retailer and will deteriorate every hour that it is in her possession. As usual, ignorance and prejudice conduce to the disadvantage of all concerned.

As we gain a deeper insight into the effect of small variations of temperature on the rate of flesh decomposition the need for low temperatures in the handling of perishable produce and the quick response which a rise of even a few degrees calls forth in the form of undesirable results, impresses one forcibly. Like every other good thing on earth, refrigeration can be abused. It is to the ultimate welfare of the industries employing low temperatures in the handling and conservation of foodstuffs to see that no abuses occur. It is just as conduciv to the welfare of the consumer that he acquaint himself with prevailing conditions, face facts honestly, and then choose deliberately, either to return to the restricted diets natural to the varying seasons and different localities, or to accept intelligently the great variety of foods—both geografical and seasonal—provided by refrigeration and the use of long-continued low temperatures designated "cold storage."

We have seen what care is necessary in handling, packing and cooling eggs to prevent great losses from incubation and decomposition favored by heat, and also to prevent mechanical breakage from rough treatment in loading and in transit. In the producing sections, eggs should be bought on a quality basis as determined by candling, and not by the case count, which means a low price for the good and bad eggs together, based merely on the number of dozens. Furthermore, the shipping of fertile eggs can be reduced to a minimum with consequent great saving of eggs, which would otherwise incubate, even in a short time, under high summer temperatures. Proper stowing of cases in cars and careful loading are real factors in conserving the egg supply. The application of refrigeration to eggs is, from an economic viewpoint, even more important than is its application to drest poultry because eggs have become an almost universal food in homes of rich and poor alike. About ten per cent. of the eggs produced are lost by bad handling before they reach the consumer. A much greater proportion deteriorate in quality and, consequently, in money as well as food value. The deterioration begins on the farm with the carelessness of the farmer. It is aggravated by the hot storeroom and by the long holding of the country merchant, and continues while the eggs travel in box cars to the shippers—a few cases at a time—and even beyond him to the city, unless he is provided with mechanical refrigeration and ships under refrigeration. The early spring eggs that reach him before warm weather are almost universally fresh. By applying refrigeration continuously and promptly he can retard deterioration to such an extent that the egg is still edible at the end of nine months.

For eggs that are small, dirty, or cracked, the process of breaking and freezing offers an outlet that is rapidly gaining in favor in the cities, and will help to save for food purposes the large amount of material otherwise wasted. The same argument applies to dried eggs. Great care must be used to obtain the most careful elimination of eggs unfit for food and to see that the greatest cleanliness is observed in a breaking room. When these requirements are met, frozen and dried eggs are a wholesome food and represent a distinct saving of a valuable commodity.

CONSERVATION OF FISH FOODS.

In the fish and shellfish industries, certain opportunities for improvement exist and, fortunately for these industries, no one is better aware of this fact than certain of the people in the business. In every city, there are a few progressiv men who are far-sighted and frank enuf to realize that many undesirable practices need to be eliminated, in order to make the fish industry develop to the extent that is justified by its importance. A keener realization of the extremely perishable character of fish, especially in the warm weather, would prevent great losses to all concerned. The fish freezers should be as near the point of production as is possible, in order to secure perfectly fresh fish for freezing and storage. The producer who ships his fish with insufficient ice and the retailer who does not have his fish on ice every minute are equally short-sighted and must expect to suffer losses continually. The fish producer is often made to realize, by the wholesaler who handles his stock, the futility of economizing on ice in his shipments, while the retailer must also be taught by sad experience that the consumer will not buy tainted fish. All fish and oysters should be thoroly chilled as soon as possible and kept chilled for some time before shipment, in order to save refrigeration in transit, as well as to prevent any deterioration before shipment. The wholesaler is learning the necessity for more care in handling a commodity as perishable as fish, and consequently the quality of fish sold is improving. Also, the conscientious dealer no longer thinks of freezing fresh fish already exposed for sale. At times, unscrupulous dealers have tried to save such fish by freezing, but it is plain that fish frozen in poor condition cannot compete with stock which was fresh when frozen. The retailer trying to do a one-day-a-week business too often buys fish when they are cheap and holds them under insufficient ice until "fish" day comes again. This results in a tainted product which prejudices many people against fish in any form. Another reprehensible practice is that of buying frozen fish, thawing them and selling to the consumer as fresh fish at correspondingly high prices. This is unfair to refrigeration in general, which, properly used, means a saving and not an opportunity for unjust profits. Also, the retailer is injuring the fish industry as a whole by the common practice of having standard prices for certain fish, since he makes no effort to allow the retail prices in his market to follow the wholesale prices as they fluctuate from day to day. The large department stores are doing a very good work in keeping fish in ice under sanitary conditions, selling fish every day instead of on fast days, and allowing their prices to fluctuate with the wholesale prices paid. In time, these department stores will help educate people in the proper care, use and prices of fish, and this will ultimately mean a great deal for the fish industry.

In the shipping of fish and shellfish, a greater use of standard containers would be a great saving, because the increast uniformity would enable the railroads to make better rates, and this uniformity would also reduce the labor of keeping accounts. The halibut and salmon boxes from the Pacific districts are uniform in size, and also the boxes for holding frozen fish in storage in the Atlantic coast districts are slowly being made uniform. This needs to be done in the case of barrels and boxes for shipping fresh fish with ice. A box of standard size with projecting side boards for handles and to prevent placing in any other than the proper position, would save much time in handling, as well as give a much better basis for making favorable shipping arrangements with the carriers. An oyster package of standard size and shape would have the same effect in that industry.

The education of all shippers of fish and shellfish in the matter of using ample refrigeration, whether in the form of adding ice to fish in small lots, or icing car loads, would insure the arrival of the perishable commodity in good condition and result in a saving of food to the consumer and money to the shipper.

The conservation of foodstuffs is even more fundamental to the welfare of our people than the saving of forests and minerals. It behooves us to study the problem carefully and to utilize every means that ingenuity can devise to save all that we raise. Among the most important means to this end is refrigeration; and when refrigeration is combined with an intelligent application of the facts that scientific investigation has shown to make for stability in perishables, the questions of distance from the consumer, decay at the market center and waste during the season of overproduction will very largely lose the menace they now hold.

DISCUSSION.

E. H. Webster, General Superintendent of the California Central Creameries, San Francisco:

The subject which I am to discuss briefly this morning is one of the most important with which we have to deal in the whole question of the economics of the home. Good dairy products begin at the farm and by a like method of reasoning bad products begin there also. We must have a clean healthy cow and a clean healthy milker. From the time the milker begins to draw the milk to the time it reaches the consumer the question of sanitation is of utmost importance. If the cow or the milker are not healthy the milk may be dangerous. Contagious diseases of many forms may easily be transmitted thru the milk and the children will be the ones to suffer.

I will not discuss the details of sanitation, for this subject is well covered by the literature of dairying and is well known to most physicians.

The transportation of milk under proper conditions is of vast importance and is not given enuf consideration by transportation companies. This is a commercial problem that has to be solved. It is frequently the case that refrigeration is not supplied by transportation companies for the reason that the cost would be greater than the rates would bear. The consumer needs and must be provided with better dairy products but he must at the same time be willing to pay the extra cost that it is necessary to incur in making them better. The influence of refrigeration in transit or the lack of it has not been given sufficient consideration by sanitarians and health authorities, particularly with reference to milk and cream. Good refrigeration is very essential. It should begin as soon as the milk is drawn from the cow and continue, except during processes of manufacture, until the finisht product reaches the consumer. One of the neglected places in the course of milk movement is the farm. Quick and thoro cooling is not regarded with enuf concern. We have much difficulty in the interior valleys of California because of high temperatures of air and water to sufficiently reduce the temperature of milk or cream so as to insure safe transit to market. Under these circumstances it is essential to employ extreme care in handling on the farm. It is altogether probable that the best solution is to bring the factories for the manufacture of the product close to the farm and put them in transit to the city only after they have been pasteurized and properly refrigerated.

Pasteurization is becoming almost universal and it is a good thing. Much of the prejudice against pasteurized milk is disappearing for the reason that systems have been workt out which do not destroy the quality of the milk. For drinking purposes milk that has been heated to 140 to 145 degrees for 25 minutes is proven acceptable in most all cases and such milk does not convey the organisms of disease.

We are gradually adding safeguards which will make it possible to supply the public with clean, wholesome dairy products, and of such nature as to satisfy our palates and give safety to the purchasers.

INFANT MORTALITY AND URBAN, HOUSING, AND LIVING CONDITIONS.

By **Henry H. Hibbs, Jr.**, A.M., sometime Fellow in Research, Boston School for Social Workers.

Even the most hasty examination of almost any report on vital statistics will show how widely infant mortality rates vary among different countries, states, cities, and other communities. A recent report of the Registrar-general for England shows that the mortality rates for infants varied from 204 deaths per 1,000 births in Hungary for the five-year period from 1906 to 1910 to about 70 in New Zealand and from 313 in Moscow to 85 in Sydney and 92 in Stockholm. In a similar way the annual reports of the Bureau of the Census on mortality statistics of the registration area of the United States show how year after year certain states and cities have higher infant death rates than others. In these cities also the rates are not equal everywhere, some of the wards and blocks having rates much higher than the average for the city as a whole while others have rates much lower. Such wide and constant variations are not due to chance and the many attempts that are now being made to discover their causes and to explain why certain types of communities, cities, states, and countries have a high infant mortality rate while others, often not far distant, have a moderate or even a very low rate furnish one of the most interesting and helpful fields of discussion in vital statistics. All the causes of infant mortality are concerned in this question but in accounting for strictly community variations, community and home conditions are especially important. It is with some of these conditions that this article will deal.

THE INFLUENCE OF URBAN CONDITIONS OF LIFE ON INFANT MORTALITY.

One of the most striking and constant differences in mortality rates existing in the whole field of vital statistics is to be found when urban and rural districts are compared. The difference appears whenever the deaths of persons of all ages in the two areas are compared; but it is especially great in the case of infants and young children, those classes of the population most affected by the influence of adverse environmental conditions. Thus, Bulletin 109 of the Bureau of the Census shows that in 1910 the death rate per 100,000 population for infants was 36 per cent. higher in the cities (326) than in the rural parts of the registration area (240). The per cent. of excess of the death rate for children under five years of age in the cities (460) was 38 per cent. higher than in the country (333) while the per cent. of excess of the rate for persons of all ages was only 19 per cent. higher in the cities (1,590) than in the country (1,340). Confining ourselves strictly to the problem of infant mortality it will be necessary to examine certain aspects of this excessiv urban mortality in detail, with a view particularly to ascertaining to what extent the excess of deaths in the cities is due to preventable conditions. The following table shows the death rate in 1911 per 1,000 population under one year of age for infants classified by age at death in the cities and rural parts of the registration states with the per cent. of excess of the rate for the cities over that for the rural districts.[1]

Age at death.	Cities.	Rural districts.	Per cent. of excess.
Under 1 year	135.9	94.1	44
Under 1 week	34.7	28.7	21
1 week to 1 month	18.8	14.9	26
1 to 3 months	24.6	15.9	55
3 to 5 months	24.6	15.5	59
6 to 8 months	18.6	10.8	72
9 to 12 months	14.4	8.4	71

An examination of this table shows that the infant death rate per 1,000 population under one year of age is higher in the cities than in the rural parts of the registration states at each age period but that the per cent. of excess of the rate for the cities increases with the age at death, being least during the first week and month and greatest during the last six months of infancy. Thus, the infant death rate for the cities in the age period from six to twelve months exceeded that for the country districts by about 70 per cent., while for the period from three to five months the per cent. of excess was 59, for the period from one to three months 55, and for the periods from one week to one month and under one week only 26 and 21 per cent., respectively. The greatest excess of the urban over the rural death rate thus occurs during the later and not the earlier months of infancy. Before pointing out, however, that the excessiv death rate is due to preventable conditions, the causes of the deaths of infants in the two areas should be compared. This is done in the following table which shows the infant death rate in 1911 per 1,000 population under 1 year of age from certain important causes for the cities and the rural districts of the registration states, with the per cent. of excess in the rate for the cities over that for the rural districts:[1]

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[1] Twelfth Annual Report of the Bureau of the Census on Mortality Statistics for the year 1911, pp. 537–8. Population in 1911 estimated by the Bureau of the Census.

Cause of death.	Cities.	Rural districts.	Per cent. of excess.
All causes	135.9	94.1	44
Diarrhea and enteritis	371.2	191.6	71
Premature birth	210.8	157.7	34
Congenital debility	168.5	119.2	41
Injuries at birth	45.1	26.4	71
Congenital malformations	66.6	57.6	16
Broncho pneumonia	111.5	52.4	113
Pneumonia	59.3	51.0	16
Acute bronchitis	37.0	21.5	72
Convulsions	30.8	26.4	17
Meningitis	18.3	16.7	10
Tuberculosis—all forms	25.1	16.6	5
Measles, diphtheria and croup, whooping cough, and scarlet fever	50.0	45.8	9
Syphilis	22.1	4.6	38
All other causes	142.8	154.0	8[2]

From every cause of death of sufficient importance to warrant its separate inclusion in the table the death rate per 1,000 population under one year of age was greater in the cities than in the rural districts. The difference in the rates from each cause varied considerably. The per cent. of excess of the death rate for the cities over that for the rural districts from broncho pneumonia, diarrhea and enteritis, acute bronchitis, and injuries at birth was greater than that for all causes combined. The per cent. of excess from congenital debility, premature birth, congenital malformations, pneumonia, convulsions, meningitis, the five infectious diseases, measles, diphtheria, croup, whooping cough, and scarlet fever, syphilis, and all forms of tuberculosis was less than that for all causes combined. Grouping these causes of death in accordance with the international classification it will be seen that in general the higher infant death rate in the cities than in the rural parts of the registration states is the result of a higher death rate from all important causes. The diseases of the digestiv and respiratory systems (pneumonia excepted) play a larger part, however, in making up the excessiv urban death rate than do the diseases of early infancy (injuries at birth excepted), congenital malformations and the diseases of the nervous system.[1] This fact that the diseases of the digestiv and respiratory systems have the predominant influence in causing the higher infant death rate in urban than rural districts has frequently led to the statement that the excessiv rate for cities is due to "bad air" and "bad feeding" or "impure milk" diseases. Such a statement does not represent the entire truth, however, for, as this table shows, the infant death rate from all important causes is higher in the cities than in the country. Rather should it be said that "bad air" and "impure milk" diseases play the most important part in bringing about the higher rate of mortality in urban than rural districts.

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[1] Prev. cit., pp. 537–38.

[2] Per cent. of excess of rate for rural districts over that for cities.

It has now been shown that, altho the death rate is greater in urban than in rural districts in each age period of infancy, the

[1] Of the two exceptions to this generalization, injuries at birth and pneumonia, the former may be due to differences in certifying and diagnosing causes of deaths in urban and rural districts—altho this is by no means certain. In any case, the per cent. of infant deaths in the registration states from injuries at birth was so small (3 per cent.) in comparison with the much greater proportion caused by the other diseases of early infancy (16 per cent. from premature birth and 12 from congenital debility) that the tendency shown by the above classification is not vitiated thereby. The exception in the case of pneumonia is more important, however, as the deaths from this cause constituted a rather large proportion of the deaths from respiratory diseases and it should prevent the pushing of the conclusion drawn from the classification too far.

per cent. of excess of the rate for the cities over that for the country districts increases in direct ratio with the age of the child, being least during the first weeks and months of infancy and greatest during the last. In a similar manner it has also been shown that, altho the infant death rate from every important cause of death is greater in urban districts, the per cent. of excess of the rate for the cities over that for the country districts is much greater in the case of the diseases of the digestiv and, to a lesser extent, of the respiratory system than in the case of the diseases of early infancy and congenital malformations. Both of these facts—that the infant death rate in cities is especially high during the last six months of infancy and that it is especially high from digestiv and respiratory diseases—indicate that the higher mortality rate among infants in cities than in rural districts is largely due to the influence of "postnatal" conditions affecting the infant after birth. Now, as the writer has shown in another article,[1] the deaths of infants resulting from the influence of postnatal conditions are more easily prevented than those due to the influence of prenatal conditions. The conclusion, therefore, seems well founded that the higher rate of infant mortality in urban than rural districts is to a large extent the result of preventable causes.

Further than this it is very difficult to go in the search for the causes of the higher mortality rate among infants in urban than in rural districts for it is well nigh impossible to put one's finger on the specific factors which bring about the difference. Congestion and overcrowding, impure air and bad sanitation certainly play a large part; but they are not the only, or perhaps, even the most important factors concerned. When urban and rural mortality is compared there are many things to consider. In cities there is probably a wider and more extensiv interest in the prevention of infant deaths than in the country. Medical attendance, hospitals, free dispensaries, and other artificial means of curing disease and prolonging life are better developt as a rule in cities than in the country, while in some cities the water supply and sanitation are also better than in small villages and country places. On the other hand, other conditions are present in large towns and cities which counteract these advantages. The milk supply is usually not so good as in the country while the natural aids to survival and the prevention of sickness are less effectiv. The effect of bad sanitation, poverty, impure air, a poor water supply and the neglect of the elementary requirements of health is also probably greater in the cities. Excessively large families also probably exert a greater influence on infant mortality in cities than in the less-crowded country communities while a smaller number of children would constitute a "large family" in the cities than in the country.[1] The employment of women in extra-domestic occupations is also more extensiv in the cities and large towns and artificial feeding is probably more often employed there also. Finally, domestic and home conditions in general are probably on the whole more favorable to infant life in the country than in cities. As Dr. Newman says, "the homelessness of the people is one of the worst features of town life, and is operating injuriously on infancy. Of that I do not think there can be any doubt in the mind of a careful observer of the life of the poor in a great city. He may not be able to put his finger upon any one item which is affecting the mother and killing the infant, for an infant is a complex organism, and bears within itself a temperament, a physique, and a heredity composed of a vast array and medley of influences inextricably interwoven. But he will be able to say that the general conditions of domestic life in a city tenement are such as to make the rearing of infants a difficult and doubtful undertaking."[2]

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[1] Southern Sociological Congress: Proceedings of the annual meeting for 1915—Health Crusaders. Nashville, 1915. Space does not permit the writer to quote from this article more in detail.

THE RELATIV DECLINE IN INFANT MORTALITY IN URBAN AND RURAL DISTRICTS.

On the other hand, conditions in cities have greatly improved in the last generation as a result of the great advances in sanitation and preventiv medicine and of the widespread efforts that have been made to prevent disease and lengthen life; and on the whole this improvement has probably been greater in the cities than in the country districts. This would lead one to expect that the markt decline[1] which has occurred in the infant mortality rate in recent years will be found upon comparison to have been greater in the cities than in the country. Unfortunately such a comparison cannot be made for most countries or for any part of this country because figures extending over a sufficiently long period to avoid the influence of superficial and temporary conditions are lacking. The only countries for which such figures are available are Germany and Prussia and these are given in the following table which shows the decline in the infant mortality rate per 1,000 births for the cities and the country districts of Prussia between 1876–80 and 1901–03 and of Germany between 1886–90 and 1907–08:

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[1] See the writer's article in a recent number of the Quarterly Publication of the American Statistical Association on Infant Mortality and the Size of the Family. (September, 1915.)

[2] George Newman, M.D., Infant Mortality—A Social Problem. London, 1906, p. 180.

Years.	Cities.	Country districts.
PRUSSIA.[2]		
1876–80	211	183
1881–85	211	186
1886–90	210	187
1891–95	203	187
1896–1900	195	185
1901–03	180	176
GERMANY.[3]		
1886–90	210	187
1896–1900	195	185
1901–06	181	178
1907–08	156	164

An examination of this table shows that in both countries the decline in infant mortality in the period considered was greater in the cities than in the country districts. In Prussia the per cent. of decrease in the rate for the cities was 14.7 per cent., over three times as great as in the country (3.8), while in the German Empire the decline in the cities (25.7 per cent.) was almost twice as great as that in the country (12.3 per cent.). Moreover, in Prussia the falling off in infant mortality was so much greater in the cities than in the country that by the end of the period 1901–03 the rates had become practically equal, while in Germany the decline in the cities was so much greater that at the end of the period 1907–08 the rate for the cities had reacht a point somewhat lower than that for the country—a very unusual condition to say the least.

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[1] See the Twelfth Annual Report on Mortality Statistics for the year 1911 (pp. 24–26) by the U. S. Bureau of the Census.

[2] Zeitschrift des Koeniglich Preussischen Statistischen Landesamts. Bd. XV, s. xvii. Infants of illegitimate birth not included in either case.

[3] Statistik des Deutschen Reichs. Quoted in Dr. Helen MacMurchy's Spec. Rep. on Infant Mortality to the Leg. Assembly of Ontario, Toronto, 1911, p. 26. She does not cite the source of this data. Years 1891–96 were not included.

The lack of statistics prevents the continuance of this comparison for other European countries so that no general conclusion as to the relativ decline of infant mortality in urban and rural districts can be drawn for the continent as a whole.[1] An indirect method of comparison is possible, however, from which a very strong probability can be establisht that tendencies in other European countries in this respect are not different from those in Prussia and the German Empire, *i. e.*, that of comparing the decline in the infant mortality rate for the large cities of each country with that for the country as a whole. Applying this method of comparison to the countries and cities included in the section on vital statistics of the annual reports of the Registrar-general for England and Wales,[2] the following table showing the percentages of decrease in the infant mortality rate during the period from 1881–85 to 1906–10 for the countries and their large cities has been drawn up.

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[1] Somewhat similar figures can be compiled from the Sixty-fifth to the Seventy-third Annual Reports of the Registrar-general for Births, Deaths, and Marriages in England and Wales showing the decrease in the infant mortality rate for rural and urban counties between 1897 and 1910. These figures are of no value in this connection, however, since it is not urban and rural districts that are being considered but a group of "counties which are mainly urban in character" with another group "in which the rural character greatly predominates, altho the group contains some considerably urban communities." Since 1910 this method has been given up in favor of another which furnishes "a more satisfactory basis of comparison," *i. e.*, "one in which the representative urban area is entirely urban and the representativ rural area entirely rural." See also annual report for 1906, Vol. 69, pp. xxvii and lxxi.

[2] Seventy-third and Seventy-fourth Annual Reports of the Registrar-general for Births, Deaths, and Marriages in England and Wales, pp. xciv and 105–15, respectively. Rates for 1881–85 and 1906–10 are five-year averages.

AUSTRALIAN COMMONWEALTH	37.6
Sydney	50.9
Melbourne	44.4
DENMARK	20.0
Copenhagen	36.1
ENGLAND AND WALES	15.8
London	24.0
FRANCE	24.6
Paris	34.6
HUNGARY[1]	18.4
Budapest[1]	24.1
IRELAND	0.0
Dublin	17.0
Belfast	4.7
ITALY	17.3
Milan	17.3
THE NETHERLANDS	31.5
Amsterdam	55.7
Rotterdam	49.8
The Hague	53.7
NORWAY	29.3
Christiania	39.7
PRUSSIA	18.8
Breslau	32.9
Berlin	41.3
Hamburg[2]	32.4
Dresden[2]	35.4
Munich[2]	42.6
SCOTLAND	4.3
Glasgow	13.2
Edinburgh	6.3
SWEDEN	32.8
Stockholm	55.6

Thus, in every country of Europe and Australia for which statistics are available with one unimportant exception a greater decrease occurred in the rate of infant mortality for the large cities than for the country considered as a whole. The single exception was in the case of Italy where the decline in the rate for the country as a whole and for the one large city included was the same.

Similar data are available for only one state in this country, Massachusetts, where the decline in the rate for the state as a whole can be compared with that for Boston, the chief city. Thus, between 1881–85 and 1906–10 the infant mortality rate for Boston declined from 186 to 133, a decrease of 28.5 per cent., while the rate for Massachusetts declined from 160 to 133, a decrease of only 16.9 per cent. Starting at the beginning of the period with a rate of 26 deaths for 1,000 births higher than that for Massachusetts the decline in Boston was so much greater that by the end of the period both rates were equal.[3]

[1] Per cent. of decrease between 1891–95 and 1906–10.

[2] These three German cities, tho not in Prussia, are added for comparison.

[3] Figures for Massachusetts are from the 17th Annual Report of Births, Deaths, and Marriages for the year 1911, p. 180, and for Boston from the 40th Annual Report of the Department of Health for the year 1911, p. 171. This same method of comparing the decline in the infant death rate for the states included in the registration area in 1900 which occurred between the census year 1900 and the calendar year 1911 with the decline in the

Obviously these figures cannot be accepted as an entirely adequate substitute for a direct comparison of the decline of infant mortality in urban and rural districts such as was given for the European statistics and Massachusetts. They do show clearly enuf that in all countries for which statistics are available the infant mortality rate has declined more during this period of thirty years in the large cities than in the country districts and small towns. The exclusion of the cities from the returns for the entire country, which would be necessary in compiling the rate for the rural districts, would make the contrast between the large cities and the rest of the country all the more striking. It is not certain, on the other hand, altho it is highly probable, that the decline in the rate for the large cities is a fair index in this respect of tendencies existing in all cities or urban districts as a whole. Yet, taken in conjunction with the figures for Prussia and Germany comparing the decline in the two areas directly, they do create a very strong probability, if not the certainty, that the decline

cities of 100,000 inhabitants or over in each state can be made from the table given in the Eleventh Annual Report of the Bureau of the Census on Mortality Statistics for 1911 (p. 25). The per cent. of decrease in the infant death rate per 1000 population under one year of age for these states and cities during this period was as follows:

Michigan	8	Connecticut	17
Detroit	16	New Haven	13
Grand Rapids	27	Bridgeport	20
New Jersey	21	Massachusetts	19
Jersey City	27	Boston	17
Newark	33	Worcester	17
Paterson	38	Fall River	21
		Lowell	27
New York	19	Cambridge	33
Buffalo	7		
Albany	18	Rhode Island	30
New York	31	Providence	36
Syracuse	+11		

An examination of these figures shows that in three of the six states a smaller per cent. of decrease occurred in the infant death rate for the state at large than for any of the cities, while in the three others the per cent. of decrease in the rate for the state was greater than that of about half the cities in each case. These figures are of practically no value for the purpose because they extend over too short a period of time to avoid the risk of the over-influence of temporary and superficial factors and because they are based on one year periods instead of five year periods, as was the case in the tables giving the figures for the European countries and for Massachusetts. These two objections make the use of these figures as an indirect means for comparing the decline in infant mortality in urban and rural districts of little value.

in infant mortality which has occurred during the last thirty years has been greater in urban than in rural districts.

It has now been shown that the rate of infant mortality is generally higher in urban than rural districts and that the excessiv death rate for the cities results, to a much larger extent, from the influence of postnatal than prenatal conditions and to a larger extent from preventable than nonpreventable causes. In view of this it has also been stated that the recent decline which has occurred in infant mortality should be expected to result in a greater proportional reduction in the rate for urban than rural districts. The lack of statistics extending over a sufficiently long period has made it impossible to show this directly except for two countries but the use of an indirect method of comparing the per cent. of decrease in the rate for an entire country with that for its chief cities showed that the decline in infant mortality during the last thirty years in the principal foreign countries was greater in the large cities than the rural districts. This also proved to be the case in the one state of this country where such a comparison could be made, Massachusetts. In the two countries where a direct comparison was possible, Prussia and Germany, it was shown that the per cent. of decrease in the infant mortality rate for the urban was greater than that for the rural districts. From this direct and indirect method of comparison the conclusion is to be drawn that in countries where the rate of infant mortality has been declining for a considerable period this decline has probably been greater in urban than rural districts.

The significance of the greater decline in the number of infant deaths in the cities than in the country is obvious. It is decidedly encouraging when considered from the standpoint of the prolongation of life and the conservation of the public health; for this markt decline in the mortality of infants in cities has been brought about by methods which if applied in a similar manner in the country and in small towns would probably yield as gratifying results. Such figures as these just quoted demonstrate beyond a doubt that the improvement in sanitation, in housing, and in living conditions in general, combined with the great advances in preventiv medicine, has been so successful in the cities that a wider extension of the campaign to the country is imperativ.[1]

THE INFLUENCE OF CONGESTION AND OVERCROWDING ON INFANT MORTALITY.

One of the conditions producing a higher rate of mortality in urban than rural districts is, as has already been pointed out, congestion and overcrowding. The influence of this factor is very difficult to measure and this must be fully appreciated at the outset. It is a factor, moreover, the influence of which can never be entirely separated from that of the other closely related conditions, such as poverty, the size of the family, and the character, strength, and intelligence of the mother. These two difficulties combined with others that might be mentioned make the study of the influence of congestion and overcrowding on infant mortality a very difficult one and necessitate the use of the most refined methods if conclusions are to be drawn with any assurance of accuracy.

Broadly speaking, there are two methods of approach to the problem; first, by the study of congestion and overcrowding as measured by the density of population per acre or square mile in a given area; and, second, as measured by the number of persons per room in individual households. It is obvious that the first of these methods of studying congestion in relation to area is very crude and defectiv. Certainly when the areas compared are whole countries or even cities, no conclusiv results can be expected, as such areas are not even approximately equally congested in all their parts or sufficiently alike in other respects to justify the making of such a comparison. Neither can the wards of a city when compared be expected to show any significant relationship between density of population per acre and the rate of infant mortality. Such comparisons have often been made but always with unsatisfactory results. In Boston, for instance, practically no relationship whatever can be found to exist between density of population per acre on occupied land in the various wards and the rate of infant mortality.[1] Wards 6 and 8 where density of population is greatest usually have very low, and sometimes the lowest, rates of infant mortality in the city, while in the other wards the relationship between the two conditions is no closer.

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[1] For a good example of preventiv work which reaches rural as well as urban districts see the recent report of the U. S. Children's Bureau on the New Zealand Society for the Health of Women and Children—an Example of Methods of Baby-Saving Work in Small Towns and Rural Districts. This publication can be obtained from the bureau free of charge.

The reason for this is not that no relation exists between congestion and infant mortality but that density of population per acre is too crude a method of measuring degrees of congestion and overcrowding to bring out the true relation to mortality. Ward lines were not intended to mark off sanitary or overcrowded areas and they are very rarely even approximately uniformly congested in all their parts, different sections, blocks, and tenements presenting an infinit variety of degrees of congestion. The population, moreover, is usually far from homogeneous in nationality, economic condition, and standards of life—to mention only a few of the diversities. It is very doubtful whether it is possible to divide a city into such homogeneous and evenly congested districts that, when classified according to density of population per acre, any conclusiv relationship to the rate of infant mortality will be revealed. As has already been pointed out congestion is so inextricably interwoven with the other factors of the problem that a much better method of measuring it than density of population per acre is necessary. To study the problem with any hope of accurate results it will be necessary to carry the investigation into individual households and to study the relation of congestion to infant mortality family by family.

It should also be mentioned, before leaving this fase of the subject, that it is very doubtful whether density of population per acre has any markt influence on infant mortality in itself. As Dr. Newsholme, the eminent English public health officer, has pointed out, "given houses properly constructed and drained, and given cleanly habits on the part of the tenants, increast aggregation of population on a given area has no influence in raising the death rate, except in so far as it is accompanied by overcrowding in individual rooms, an evil which is by no means necessary under the circumstances named. In other words, there is no causal relationship between density of population *per se* and a high mortality. The true index of density is the number of persons to each occupied room."

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[1] See the Report of the Massachusetts Homestead Commission, Boston, 1913 (House Document No. 2000), p. 20.

Realizing the inadequacy of density of population per acre as an index of congestion, Dr. George Newman, Medical Officer of Health of the Metropolitan Borough of Finsbury, Central London, in studying the problem of infant mortality in his own district, used a method which closely approximated, altho it does not fully meet the requirements of "the true index" as prescribed above by Newsholme. In this investigation, the results of which are summarized in the following table, he correlated the rate of infant mortality with the number of rooms which the family occupied:[1]

Size of tenement.	Number of births.	Infant mortality rate.
The borough	2,886	148
One room	532	219
Two rooms	1,216	157
Three rooms	468	141
Four rooms and over	464	99
Unknown	206	39

An examination of this table shows that in this district of Central London the number of rooms which the family occupies is an important factor in infant mortality. This method of studying the problem, however, does not take account of the number of persons in the family. Yet, in spite of this limitation, the table can be taken as furnishing a fairly accurate general indication of the influence of congestion and overcrowding on the death rate among infants, since it would appear that even the smallest family would find a one-room tenement very congested quarters and that the family of average size would find themselves very much overcrowded in a two-, and moderately overcrowded, in a three-room tenement.

In tabulating the results obtained in an investigation of infant mortality in Wards 6, 8, 13, and 17 of Boston, recently made by the Research Department of the Boston School for Social Workers, the use of the average number of persons per room in the home as an index of congestion and overcrowding was first considered; but several objections to this method soon appeared.[1] In the first place, lodgers and boarders often cause a higher degree of congestion in the family than their actual numbers indicate, as the rooms which they occupy are not always as crowded as those which are left for the children and the father and mother. Some families also set aside one room for use as a parlor or for some other similar purpose, even tho it be at the expense of greatly overcrowding the other rooms, while others do not—and no account of this difference is taken when the number of persons and the number of rooms is combined in a ratio. But the chief objection to the use of the average number of persons per room as an index of congestion in the homes of the infants visited is a practical one arising from the fact that the visit was not made until the child was a year old which often made it impossible for the mother to recall just how many persons were living with the family, including lodgers, boarders, relatives, grown children, and others, during the first year of the child's life. In other cases the number of persons in the family is not the same thruout the entire year, while in still others the family may have moved to a new home where the number of rooms was not the same as in the old. All these objections and others that might be mentioned tend to lessen the value of the average number of persons per room as a measure of the extent of congestion and overcrowding in the infant's home during its first year of life.

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[1] Geo. Newman, M.D.: Infant Mortality. London, 1905, p. 184.

There is another method of measuring the extent of congestion and overcrowding in the home, however, which is not subject, to such a large extent, to the objections just named and which, altho it has not been often used, was found in both the Boston and Johnstown investigations to provide the best working method for attaining this end—the number of persons sleeping in the room with the infant. The advantages of this method over the others are plain. It considers the use to which the rooms are put—if the actual congestion in the bedrooms and the rest of the house is increast by the withholding of one room for use as a parlor or if lodgers occupy a larger proportion of the rooms in proportion to their number than the other members of the family this condition will, in the great majority of cases, be reflected in the number of persons sleeping in the room with the infant. The number of persons sleeping in the room with the infant is also more easily and more accurately obtainable in a great many cases than the number of persons in the home, particularly when the family "takes in lodgers" and when relatives and grown children live with the family at certain times but not regularly. When the infant's sleeping room only is considered account can also be taken of the size of the room, a thing which is practically impossible when all the rooms in the home are taken into account. As has been frequently pointed out, the influence of congestion and overcrowding is so closely interwoven with that of the other domestic and social factors of infant mortality that in the study of the problem the method of measurement chosen is of fundamental importance.

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[1] The writer is indebted to Dr. J. R. Brackett, Director of the School for Social Workers, for the use of data collected in this investigation which will be quoted later on. These figures have not been previously publisht. The investigation was made in the academic years 1910–11 and 1911–12. During the second of these years the field work was carried on under the direction of the writer supervised by the director of the research department, Dr. T. W. Glocker.

The following table shows the relationship between congestion and overcrowding, as indicated by the number of other persons sleeping in the room with the infant, and the rate of mortality for infants visited in both the Boston[1] and Johnstown investigations:

BOSTON INVESTIGATION.[2]

Number other persons sleeping in room with infant.	Number of births.	Infant mortality rate.
Total	1,899	92.2
Two or less	1,315	86.7
Three	403	81.9
Four or more	181	154.7

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[1] See previous note. Visits were made in this investigation to the homes of all the infants born in the four wards in 1910 with a few exceptions. Answers were obtained in 2,063 cases.

[2] Information was not obtained in 164 instances.

JOHNSTOWN INVESTIGATION.[1]

Number other persons sleeping in room with infant.	Number of births.	Infant mortality rate.
Total	1,382	87.8
Two or less	600	66.7
Three, four, or five	725	97.9
Six or more	57	122.8

Thus, in both the Boston and Johnstown investigations the infant mortality rate was found to vary in direct ratio with the number of other persons sleeping in the room with the infant—or, in other words, with the degree of congestion and overcrowding in the household. Thus, in Boston the rate was over three times as high in the homes where four or more other persons slept in the room with the infant as in those where only two other persons or less slept in the room, while in Johnstown the infant mortality rate was almost twice as high where six or more persons slept in the room with the infant as where two other persons or less slept in the room.

It is worth while to study separately the influence of congestion and overcrowding among the Italian families visited in Boston, since extreme overcrowding was so much more common among them than in any other nationality. Over twice as large a proportion of the infants of Italian parentage who were included in the investigation slept in a room with four or more other persons than was the case among infants of any other nationality (18.2 per cent. in comparison with 7.2 per cent. among the Irish, the next in order). The effect of this high degree of congestion and overcrowding on the rate of infant mortality is reflected in the following figures:

Of the 709 infants of Italian parentage[2] included in this investigation, 414 slept in a room with two other persons or less, 166 with three other persons, and 129 with four or more. Among the infants in the first group who slept in a room with two other persons or less the rate of mortality was 86.9, among those who slept in a room with three other persons it was higher, 102.4, while among those who slept in a room with four other persons or more the rate was highest of all, 155 deaths per 1,000 births.

[1] U. S. Children's Bureau: Infant Mortality: Johnstown, Pa. Washington, 1915, p. 25. No information obtained in 7 instances. No infants who did not live at least one month are included.

[2] Reference is to infants both of whose parents were born in Italy. The term "nationality" was also used above in the same sense.

Turning now to a more detailed study of the effect of congestion and overcrowding in Boston, it is significant that where the overcrowding was so great that it was necessary for four or more other persons to sleep in the same room with the infant the rate of mortality showed a decided variation with the size of the room, being lowest when the room was large and enormously higher where it was small. This will be seen upon examination of the following table which, altho it is based on a rather small number of cases, is probably in approximate accord with actual conditions. It shows the mortality rate per 1,000 births for infants visited in the Boston investigation who slept in bedrooms with four or more other persons, the rooms being classified according to their relative sizes.[1]

Size of bedroom.	Number of births.	Infant mortality rate.
Total	162	142
Large	48	42
Medium	84	155
Small	30	267

The evil effects of congestion and overcrowding are greatly increast by the presence of boarders, lodgers, and other persons in the home who are not members of the family circle. This is due both to the fact that such persons, by each occupying a larger proportion of the household than any member of the family frequently increase congestion to an extent out of proportion to their actual numbers, and that their presence in the home, especially in the poorer sections where the number of rooms in the average tenement is small, prevents privacy and necessitates the substitution of an abnormal form of community life for that of the normal family group. This latter condition is moral and social, using the term in a broad sense, as well as sanitary, and it probably exerts a greater direct influence upon the parents and the older children in the family than upon the baby. Yet this effect, thru its influence upon the mother, her standards of child care, and the amount as well as the character of the attention she can give to her children, reacts no less powerfully, tho indirectly, on the infant. In view of the fact that

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[1] No information as to size of bedroom was obtained in 19 cases.

"probably one-fourth of the foreign-born families in the United States" "take in" boarders and lodgers—not to speak of the nativ-born families—the influence of this factor both directly and indirectly must be considerable.[1] How important its influence really is, however, the difficulty of applying the statistical method to this fase of the problem has so far made it impossible to determine.

THE INFLUENCE OF HOUSING AND LIVING CONDITIONS ON INFANT MORTALITY.

The study of housing and living conditions in relation to infant mortality may for convenience be divided into three parts: first, the character and location of the house or apartment and the equipment of the home; second, the care of the home by the occupants; and, third, the number of persons living in the home in proportion to its size and the degree of relationship of such persons to the head of the family. The last of these three aspects of the problem has just been discust in the preceding section on the influence of congestion and overcrowding and the practice of taking in boarders and lodgers on infant mortality. Consideration must now be given to the other two.

In the last section attention was drawn at the outset to the necessity of exercising great care in the selection of a method of measuring degrees of congestion and overcrowding and of applying it in actual practice. The difficulties, however, of measuring the extent of overcrowding and congestion are not nearly so great as those incident to any attempt to grade homes according to the kind of care which the family takes of them. For this reason it is almost impossible to devise a working method for accurately measuring the extent of the influence of the hygienic and sanitary condition of the home on infant mortality. In both the Boston and Johnstown investigations attempts were made to measure the influence of this factor by using cleanliness and ventilation as indices of home sanitation and domestic hygiene. The method used in grading the homes visited in the Boston inquiry, however, was so rough that the data collected could not be used in determining the effect of bad sanitation on infant mortality, altho this information does furnish a valuable rough indication of the extent to which bad sanitary conditions were present in the homes visited.

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[1] In the recent investigation by the immigration commission it was found that 27.2 per cent. of the foreign-born families investigated kept boarders or lodgers. This practice was especially common among the Lithuanians (70.3 per cent.), the Poles (35.5), the Slovaks (41.0), the Russian Hebrews (32.1), and the South Italians (22.4). Of the nativborn white families 13.0 per cent. kept boarders or lodgers and of the nativ-born Negro, 33.7 per cent. See Reports of the Immigration Commission, Immigrants in Cities—A Study of the Population of Selected Districts in New York, Chicago, Philadelphia, Boston, Cleveland, Buffalo, and Milwaukee. Washington, 1911, Senate Document No. 338, Vol. 1, p. 81.

In Johnstown, on the other hand, sufficiently refined methods of measuring degrees of cleanliness and of adequacy of ventilation in the homes visited were employed to enable the results to be used in determining the relationship between infant mortality and domestic hygiene and home sanitation. The following table summarizes the results of this investigation:[1]

Grading of home.	Number of births.	Infant mortality rate.
CLEANLINESS.		
Total	1,463	134.0
Clean	943	113.5
Moderately clean	354	163.8
Dirty	166	186.7
VENTILATION.[2]		
Total	1,386	87.8
Good	604	28.1
Fair	392	91.8
Poor	390	169.2

An examination of this table shows a close relationship between the rate of infant mortality and the cleanliness and ventilation of the home. Thus, the rate for the infants who lived in dirty homes was over a third higher than that for the infants whose homes were clean. The difference between the well and poorly ventilated homes was even greater; only 28 deaths per 1,000 births occurred in the well ventilated homes while 169 occurred in those which were poorly ventilated. The influence of bad home sanitation on the rate of infant mortality appears, therefore, to be markt.

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[1] U. S. Children's Bureau: Infant Mortality. Johnstown, Pa. Washington, 1915, pp. 23 and 26.

[2] Only infants who lived at least one month included here. No information was obtained in 3 instances.

As has already been shown, these figures are also of value as furnishing an indication of the kind of care which the mothers visited take of their homes. They may also be compared with the similar data gathered in the Boston and other investigations. In reference to ventilation an examination of the table shows that only 604, or somewhat less than half of these Johnstown homes visited were well ventilated, altho an additional 392, or 28 per cent., were fairly well ventilated. In Boston, on the other hand, the proportion of inadequately ventilated homes was probably even greater, since 785, or 43 per cent. of the 1,825 mothers from whom information was obtained admitted that they never kept a window open at all at night except in warm weather.[1]

When graded according to cleanliness homes everywhere, as far as can be determined from the available statistics, show a much more favorable condition than in respect to ventilation. Thus, in Johnstown only 11 per cent. of the homes were graded as dirty (24 per cent. being graded as moderately clean, and 65 per cent. as clean) while 44 per cent. were found to be poorly ventilated. In Boston also only 15 per cent. of the homes included in the inquiry were found to be dirty at the time of the agent's visit[2] while, as has just been shown, 43 per cent. of the homes, on the statement of the mothers themselves, were never ventilated at night in winter.

Similar data collected by the United States Immigration Commission in its investigation of the population of selected districts in seven large cities, altho the question of ventilation was not considered, show about the same proportion of badly cared for and dirty homes (16 per cent.). The grading of the 10,123 households or apartments visited in this investigation was not based exclusively on cleanliness but on "the degree of care which characterized them at the time of the agent's visit," altho "in determining the degree of care both cleanliness and tidiness were taken into consideration." The detailed results were as follows: of the 10,123 homes visited 45 per cent. appeared to be well cared for and 39 per cent. fairly well cared for, while 13 per cent. appeared to be badly and 3 per cent. very badly cared for. In other words, 84 per cent. were well or fairly well cared for and 16 per cent. badly or very badly cared for.[1]

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[1] From the other 1,040 mothers who said that they did keep a window open at night accurate enuf information could not be obtained to determine whether or not the actual amount of ventilation secured was adequate to meet the needs of the family and the baby.

[2] The method of grading the homes visited in the Boston investigation was much rougher than the one used in Johnstown and, therefore, less exact.

Besides the care of the home by the occupants and its sanitary and hygienic condition, the equipment of the house or apartment and housing conditions proper may also directly affect the health of the infant and its chances of survival. Indirectly they exert an influence upon the problem of infant mortality by increasing the difficulty of the mother's caring properly for the home or for her children. This fase of the problem was inquired into in some detail in the Johnstown investigation, the results of which are summarized in the following table showing the relation of "housing accommodations" to infant mortality:[2]

Housing accommodations.	Number of births.	Infant mortality rate.
Total	1,461[3]	134.0
Water supply in house	1,173	117.6
Water supply outside house	288	197.9
City water available	1,333	132.0
City water not available	128	148.4
Water closet	739	108.3
Yard privy	722	159.3
Dry homes	808[2]	122.5
Moderately dry homes	336	139.9
Damp homes	319	156.7
Bath in home	496	72.6
No bath in home	965	164.8
Yard clean	801	99.9
Yard not clean	632	169.3
No yard	28	. . .

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[1] Reports of the U. S. Immigration Commission: Immigrants in Cities, Vol. I, pt. 5, p. 102.

[2] U. S. Children's Bureau: Infant Mortality: Johnstown, Pa. Washington, 1915, p. 23.

[3] Information as to dryness of home secured in 2 additional instances—total, therefore, equals, 1,463.

An examination of this table shows a close relationship between housing accommodations and infant mortality. Thus, the mortality rate was considerably higher for infants living in damp homes, in homes where there was no supply of city water, and in homes where there was no water closet than for those who lived in dry homes equipt with city water connection, water closet, a bath, etc.[1]

The character of housing and living conditions is determined partly by municipal regulations, partly by the standards of landlords, partly by the standards of the community in which the family lives, and partly by the wishes of the tenants themselves. Which of these exercises the greater influence it is difficult to say. Municipal regulations and the standards of landlords probably have their chief influence upon housing conditions in the strict sense but even here the choice and wishes of the tenant are very important factors, as the well-known fact that the tenants who pay the highest rents do not always receive the best accommodations would indicate.[2] The primary responsibility of the tenants for the interior of the apartment or dwelling, the extent to which it is overcrowded, its sanitary condition, and the adequacy of its ventilation will not be seriously disputed even tho it be realized that they are themselves in turn influenced by other conditions outside the home. It is here that the problem becomes inextricably bound up with the resources, the character and the intelligence of the parents. Living conditions in general, but especially domestic hygiene and sanitation, and the fitness of the home as a place for a baby to grow up in are to a very large extent the result of that factor, the importance of which can hardly be too strongly emphasized—the strength, the character, and the intelligence of the mother. The chief effect of urban conditions of life, bad housing and sanitation, and poor living conditions upon infant mortality is in all probability not direct but indirect, in that they lower the efficiency of the mother as a mother. These external conditions no doubt exercise an important direct effect on the child but their chief influence upon the problem of infant mortality is indirect; that is, housing and living conditions exert their primary influence on the child thru the influence which they have on the health, strength, and character of the mother.

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[1] It may well be questioned whether the character of the housing accommodations is not also an index of the economic condition of the family; in which case the effect of bad housing accommodations on the mortality rate shown above may be due partly to the influence of poverty. On the other hand too much must not be made of this as the disturbing influence of poverty may be offset by some other disturbing factor acting in the opposite direction. See the writer's article in the November issue of the *Quarterly Journal of Economics* on "The Influence of Economic and Industrial Conditions on Infant Mortality."

[2] Commenting on this aspect of the problem in Boston the report of the immigration commission shows how "inertia and racial cohesion may keep the tenants in their present location in spite of the fact that they can secure better accommodations for less money in other parts of the city" and remarks that it "is reasonable to suppose that the owners of the houses, rather than lose profitable tenants, would make necessary improvements if the demands on the part of the tenants were persistent enuf." See the Reports of the U. S. Immigration Commission: Immigrants in Cities. Washington, 1911, Vol. I, p. 466.

TRANSACTIONS.

ADJOURNED MEETING.

BELLEVUE-STRATFORD HOTEL,
PHILADELPHIA, September 21, 1915, 12.30 P. M.

The Academy met pursuant to adjournment and in the absence of the President and both Vice-Presidents, Dr. J. C. Wilson, of Philadelphia, was elected Chairman of the meeting.

The Council reported:

I. That the Academy at San Francisco failed to elect a member of the Sunday Afternoon Committee in place of Dr. C. L. Stevens, whose term had expired, and recommended the election of Dr. Winfield Scott Hall, of Chicago. On motion the recommendation of the Council was adopted.

II. That the Academy accept the invitation to be officially represented at the inauguration of Dr. John Henry McCracken as President of Lafayette College, and that Dr. Charles McIntire, of Easton, be elected as the Academy's representativ with power to appoint an alternate if he be unable to attend. On motion the recommendation of the Council was adopted.

III. That Dr. Helen C. Putnam had declined the nomination for Secretary because there are certain duties that are at present required that she does not think she should perform. The Council recommended the acceptance of the declination and the substitution of the name of Dr. Thomas Wray Grayson, of Pittsburgh, as the candidate for the secretaryship.

IV. Council recommended the appointment of a committee to take into consideration the changes in the by-laws suggested by Dr. Putnam regarding the duties of the Secretary and recommended that the committee consist of Dr. John B. Roberts, Chairman, Dr. Helen C. Putnam and Dr. S. D. Risley. On motion the recommendation of Council was adopted.

V. That Dr. W. L. Estes, Jr., declined the nomination for Assistant Secretary, and recommended that the declination be accepted and that the Academy empower the Executiv Committee of the Council to fill the vacancy at its convenience. The recommendation of the Council was, on motion, adopted.

VI. Council recommended the election of the following applicants for Fellowship in the Academy:

William Dewey Alsever, Syracuse, N. Y.
Samuel Horton Brown, Philadelphia.
John Decker Butzner, Scranton, Pa.
William Daniel Chase, Bethlehem, Pa.
John C. DaCosta, Jr., Philadelphia.
Charles Alfred Davlin, Alamosa, Colo.
Samuel Gibson Dixon, Bryn Mawr, Pa.
Paul Eaton, Pittsburgh, Pa.
Theodore Jacob Elterich, Pittsburgh, Pa.
William Beer Ewing, Pittsburgh, Pa.
Alfred E. Fretz, Sellersville, Pa.
Levi Springer Gaddis, Uniontown, Pa.
Donald Guthrie, Sayre, Pa.
Francis A. Hulst, Brooklyn, N. Y.
Adolph Koenig, Pittsburgh, Pa.
John Weaver Luther, Palmerton, Pa.
E. Bosworth McCready, Pittsburgh, Pa.
Grant C. Madill, Ogdensburg, N. Y.
Albert Ralston Matheny, Pittsburgh, Pa.
Granville T. Matlack, Wilkes-Barre, Pa.
Robert Talbott Miller, Pittsburgh, Pa.
Clarence Reynolds Phillips, Harrisburg, Pa.
Charles Manville Pratt, Towanda, Pa.
Frederick A. Rhodes, Pittsburgh, Pa.
Charles John Steim, Pittsburgh, Pa.
Carey Judson Vaux, Pittsburgh, Pa.
George Washington Wagoner, Johnstown, Pa.
William Kemble Walker, Pittsburgh, Pa.
James Oliver Wallace, Pittsburgh, Pa.
William Miller Welch, Philadelphia.
Cornelius C. Wholey, Pittsburgh, Pa.
Edwin Zugsmith, Pittsburgh, Pa.

Council also recommended the following to be elected to Associate membership:

Miss Elsie Voorhees Jones, Social Service Secretary of the

Third Presbyterian Church, Rochester, N. Y., nominated by Drs. McIntire and Heffron.

Mr. W. O. Hart, Commissioner on uniform state laws of Louisiana, New Orleans, nominated by Drs. McIntire and Roberts.

On motion the Secretary was authorized to cast a favorable ballot for the applicants for Fellowship and Associate membership and they were declared elected.

VII. That the Committee soliciting the McIntire Fund reported it so far advanced that it had requested Dr. McIntire to outline the uses to which the Fund should be given for the first five years. He complied by presenting a paper to the Council of which the following are the essential parts:

To the Council of the American Academy of Medicine.

GENTLEMEN:

It was a surprise when the manuscript minutes of the Fortieth Annual Meeting were received to find the following in the report of the Council:

"5. Recommending that a fund to be known as the Charles McIntire Fund be created, the interest thereof to be used for the promotion of some fase of social medicine; the specific purpose to be determined by Dr. McIntire during his lifetime, and thereafter as the Council may direct each five years."

I confess to a feeling of gratification over this evidence of esteem, altho the reward is greatly in excess of the services rendered. I am making use of this first opportunity to express my appreciation and gratitude. I was expecting nothing additional would be required of me in this connection for some time to come but have received notice from the Chairman of the Committee to present the specific purpose mentioned in the minutes, at this time.

For this I was unprepared, as I had no opportunity to confer with anyone who was at the meeting in order to become informed of the underlying thought resulting in this action. I do not even know how far my suggestion is to go, whether only to make a general suggestion leaving to you the details to be workt out by a committee, or to attempt a full scheme.

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With such meagre information it occurred to me that a better way would be to draft a tentativ document, which I could submit to several of the Fellows of the Academy on whose judgment I had relied in times past, seeking further light. In this tentativ document I presented alternativ propositions for a prize: * * * * * My friends, as usual, were very kind in their assistance and I learned * * * * * that the entire disposal of the question was to be absolutely by myself, which I rather regret, but since it is so I make the following requests:

I. That the interest on the fund for the first five years be used to establish a prize for the best essay upon subjects to be announced.

II. That this prize be not an annual one in order to permit the accumulated income to furnish a larger prize.

III. That the first prize be awarded at the annual meeting of the Academy for 1917 and the second at the meeting for 1920, thus completing the quinquennium.

IV. That the Council take upon itself the responsibility for arranging the details under a Committee on Prize Essays to consist of the President, the President-elect and the Secretary of the Academy.

V. That the Council also appoint a committee who shall decide the relativ value of the essays, awarding the prize. I would suggest that this Committee consist of either three or five, to be made up from the following Fellows of the Academy: (The list is arranged alfabetically.)

Dean T. S. Arbuthnot, Medical School, University of Pittsburgh.
Professor G. W. Crile, Western Reserve University.
Professor John Staige Davis, University of Virginia.
Professor F. H. Gerrish, Bowdoin College.
Professor Winfield Scott Hall, Northwestern University.
Dean John L. Heffron, Medical School, Syracuse University.
Professor Reuben Peterson, University of Michigan.
Professor J. C. Wilson, Jefferson Medical College.

VI. That among the provisions for deciding the prize the following be included:

Reserve the right to decline to give the prize if none of the essays are of sufficient value. In case there are several essays of especial merit, after awarding the prize to one of these, to make special mention of others and both the prize essay and those receiving special mention to become the property of the Academy to be publisht by it. The essays to be written in English and to be open to anyone. The topics suggseted are: for the first essay, "Conservation of the Middle Aged;" and for the second, "The Physician's Financial Relation to Collectiv Practice: for what service should he expect a recompense and how and what should he be expected to do freely and why?"

* * * * *

It would have been much more to my liking had the Academy itself determined these questions. I feel my inability to thoroly formulate the scheme as required by the action of the Academy and am therefore asking your advice and help in arriving at the correct decision.

The Council recommended that the Academy adopt the suggestions. On motion the recommendation of the Council was adopted.

The report of the Nominating Committee as amended by the vote of the Academy at this meeting was read and complying with the instructions of the San Francisco meeting, Dr. John B. Roberts cast a single ballot in favor of the candidates as follows:

President: Dr. George A. Hare, Fresno, Cal.

Vice-Presidents: Dr. R. W. Corwin, Pueblo, Colo.; Dr. Reuben Peterson, Ann Arbor, Mich.

Secretary: Dr. Thomas Wray Grayson, Pittsburgh.

Treasurer: Dr. Charles McIntire, Easton, Pa.

Dr. J. C. Wilson then called Dr. E. E. Montgomery to the chair and in a graceful speech presented to Dr. McIntire a beautiful silver pitcher with the following inscription, after which the Academy, on motion, adjourned.

PRESENTED TO
CHARLES MCINTIRE, A.M., M.D.,
SEPTEMBER TWENTY-FIRST, 1915
BY FRIENDS IN
THE AMERICAN ACADEMY OF MEDICINE
AS A TOKEN OF
THEIR HIGH APPRECIATION
OF HIS
FAITHFUL AND EFFICIENT SERVICES
FOR 25 YEARS.
NON SIBI SED TOTI.

The following Fellows were in attendance at the meeting:

T. D. Davis, Pittsburgh, Pa.
H. K. Dunham, Cincinnati, O.
W. L. Estes, South Bethlehem, Pa.
Spencer M. Free, DuBois, Pa.
Edgar Moore Green, Easton, Pa.
Charles McIntire, Easton, Pa.
G. Hudson-Makuen, Philadelphia.
Elizabeth L. Martin, Princeton, N. J.
E. E. Montgomery, Philadelphia.
Helen C. Putnam, Providence, R. I.
S. D. Risley, Philadelphia.
J. B. Roberts, Philadelphia.
C. L. Stevens, Athens, Pa.
W. Blair Stewart, Atlantic City, N. J.
F. L. Van Sickle, Olyphant, Pa.
J. K. Weaver, Norristown, Pa.
J. C. Wilson, Philadelphia.

FROM THE FIELD.

AMERICAN INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY.

The sessions of the American Institute of Criminal Law and Criminology were held in Salt Lake City, August 16, 1915, at the Hotel Utah.

The Executiv Committee of the Council of the American Academy of Medicine appointed the following delegates to attend this meeting: Drs. R. W. Corwin, Pueblo, Colorado, Charles G. Plummer, Salt Lake City, Utah, and Rock Sleyster, Waupun, Wisconsin. Because of the absence of Drs. Corwin and Sleyster, it becomes my duty to make a report of the meetings of the Institute.

The American Institute of Criminal Law and Criminology bears the same relationship to the American Bar Association as does the American Academy of Medicine to the American Medical Association. It is specializing in criminology, doing everything in its power to formulate methods that have for their object the prevention of crime; lightening the burdens of offenders of social laws; attempting to make provisions for the relief of the families of convicted persons and dealing particularly with the individuality of the convict, so as to return him to society in a condition that will increase his value as a citizen. Sociologic problems are dealt with in a manner highly commendable to a group of persons so closely adherent to the technicalities of human government as are these men of the law in this country. Perhaps the leaven of their membership is the mixture of persons with them who are looking at the other side of the many questions that come before their body for consideration. For physicians, nurses, social workers and other humane laborers belong with this collection of lawyers, all vieing to make the cause uppermost in the minds of men.

Unfortunately, the most of the reports of stated committees were read by title, because the chairmen were not present. The address of the President, the Hon. Robert Ralston, Philadelphia, Pa., was first on the formal program at 10.30 A. M., and he took as the basis of his paper "Abuse of Modern Criminal Procedure." Judge Ralston in his address emphasized the need of much more careful administration of the laws in our codes and called special attention to the many abuses of common privilege, in the matter of the unlimited power of anyone to purchase and use firearms; the unusual and unnecessary delays in the administration of our courts of justice; the consumption of so much time in the impanelling of juries, and made direct comparisons with the English system of trials, to the praise of English methods.

The Hon. William M. Gemmill, Chicago, Illinois, was the only chairman present to read the report of his committee. Judge Gemmill read the paper on "Employment and Compensation of Prisoners." This paper caused much discussion as to the relativ value to the state, local communities and to the men themselves of compensation of convicts for labor on state or other roads. One member injected another fase of curativ agency into the debates by asking why something was not being urged to *prevent* men and women from becoming convicted of misdemeanors by the law. Citing the saloon as an instance of the provoking cause of the downfall of so many men and women, he called upon those present to use their greatest influence for nation-wide prohibition, because he believed that would remove the cause. Another member contended that prisoners should work only for the state, or upon state materials, and thus not come in direct competition with organized labor. Still another sought to determine the point of view of organized labor when contracts were given to convicts, who thereby were afforded an opportunity to work when deserving men in freedom sought jobs and could not find them. And there was one who insisted that the families of the men in social freedom were as much entitled to support when the heads of the families were unemployed as were those families of convicts who profited by their detention in confinement. All agreed to the uplifting benefits of employment of those under restraint, and each one urged that his way ought to solve all the problems of society if it were given the proper treatment.

One other paper, the title of which was read by the secretary, was mentioned in the discussion of the above paper and the sentiment exprest that the paper ought to have been brought before the Institute for extended debate; and that was the paper entitled "Sterilization of Criminals," Joel D. Hunter, Chicago, Illinois. Someone remarkt that the body then considering this question of criminal sterilization was unfitted to make the proper investigation of such an important subject. This was so argued because of the lack of technical information of the subjects of biology and pathology on the part of the legal members of the Institute.

Because of this avoidance of a matter of such vital importance to the world at large, it occurred to me that I would like to suggest to the Council of the American Academy of Medicine that they take up this question at an early date and, either in unison with the American Institute of Criminal Law and Criminology, or alone, go into the matter as fully as science will allow, at some annual meeting of the Academy. It is quite evident among the states that have already past laws supporting the belief that heredity cuts a big figure in so-called criminalism; and because some states have already seen the folly of such legislation, at least so it seems, that there is not a harmonious view of those so directly interested in the curativ agencies advocated and that other and more centrally located (individually) causes ought to be attackt and eradicated. At any rate there is a great diversity of opinion on this subject and it ought to be thresht out at the earliest possible time. Not that even such a body of medico-sociologists as the members of the Academy could settle the question to the entire satisfaction and profit of all concerned; but any rate the convict would be given at their hands a scientific run for his manhood. It is my own belief that this matter can never be settled as the Master would settle it, until we each place ourselves in the place of the other fellow; and are stirred by the great command from Him, when we would condemn and not lift up, "He that is without sin among you, let him first cast a stone at her." With this injunction ringing in our ears and digested mentally to its fullest advantages, some results that are entirely unlookt for might startle us.

The last session of the Institute, called for 8.30 in the evening, was devoted to a formal address by the Hon. Hampton L. Carson, Philadelphia, Pa., before a large and appreciativ audience. He devoted himself to the subject, "A Sketch of the Development of English Criminal Law."

The final business of the Institute was the election of officers for the coming year. This was done by acclamation on the recommendation of a Nominating Committee. The Institute chose the following leaders: Ira E. Robinson, Grafton, West Virginia, Chief Justice of the Supreme Court of Appeals, was chosen President; Hampton L. Carson, Philadelphia, First Vice-President; Dr. H. C. Stevens, Chicago, Second Vice-President; Thomas Mott Osborne, Ossining, New York, Warden of the Sing Sing Prison, Third Vice-President; Simeon E. Baldwin, New Haven, former governor of Connecticut, Fourth Vice-President; Edwin M. Abbott, Philadelphia, Pa., Secretary; Bronson Winthrop, New York, Treasurer; Robert J. Sterrett, Philadelphia, Pa., member Executiv Board for two years; Judge William M. Gemmill, Chicago, Dr. William M. White, Washington, D. C., Dr. Katherine B. Davis, New York, and Dr. H. H. Goddard, Vineland, New Jersey, as the other members of the Executiv Committee.

The Secretary read a number of communications from various medical, law, medico-sociological and social bodies as allied members and interested parties, commending the labors of the Institute and adding their votes and influence to the efforts being put forth by them in the interest of society. An invitation was extended to all delegates from allied organizations to participate in the discussions of all papers and in the proceedings of the Institute as well.

A large and interested attendance listened to the papers by various writers and speakers, and added their commendation to the work in harmony with the legal members of the association.

The Institute adjourned to meet again in 1916, at the same time and in the same place with the American Bar Association.

CHAS. G. PLUMMER,
Delegate.

[This report is to be presented to the Academy at its meeting in 1916, but is published in advance while it is yet news.—ED.]

The United States Department of Agriculture is making good use of the Sherley amendment to the Food and Drug Act which prohibits false and fraudulent claims as to the purity of therapeutic effects of drugs and medicine by bringing the violators of the act to the attention of the courts. A circular of information recently issued by the Department shows that more than 50 legal actions have been terminated successfully, 25 of them being criminal prosecutions against the manufacturers and the remainder seizures of the fraudulently labeled medicine while in interstate commerce. It is also stated that a number of similar suits are pending which probably will be decided in favor of the Government. The Department is to be congratulated on its effort and it is hoped it will continue, thereby relieving a credulous people of a great drain upon their resources in buying worthless medicines as well as giving greater opportunity for the sick to receive proper treatment.

* * *

The National Committee for the Prevention of Blindness (130 E. 22d Street, New York City) has issued Circular No. 5 in an effort to interest women's clubs and nursing organizations in its propaganda.

After calling attention to the large per cent. of preventable blindness, it calls attention to the principal preventable causes under the headings: Babies' Sore Eyes; Midwives; Eyesight of School Children; Industrial Accidents; and Wood Alcohol. Under each division it suggests subjects for inquiry to ascertain if the local practice is taking proper precautionary measures. If they are not taken the way is open for agitation and a campaign of education.

Copies of the circular may be obtained from the Committee.

* * *

The Second International Conference on Race Betterment was held in San Francisco on August 4–8 and numbered among its speakers Dr. David Starr Jordan, Professor Irving Fisher, Dr. Ernest Bryant Hoag and others of equal prominence in sociologic and scientific circles. Dr. Kellogg, of the Battle Creek

Sanitarium, proposed a plan which would result, in the far distant future, in a human race which would be free from disease and degeneracy when hospitals and prisons would not be needed. It is to be regretted that circumstances over which we have no control will prevent our participation in the joys of living under such conditions. Luther Burbank spoke on "Evolution and Variation with the Fundamental Significance of Sex," and Paul B. Popence, the editor of the *American Journal of Heredity*, discust "The Natural Selection of Man."

* * *

At the opening exercises of the Medical Department of Syracuse University, held on the 21st of September, addresses were made by Dr. Stephen Smith, the founder and first president of the American Public Health Association, on "Sociologic Medicine," and Dr. F. H. Garrison, assistant librarian of the library of the Surgeon-General's office, on "Uses of Bibliography and Medical History in the Curriculum of the Medical School."

NOTES AND NOTICES.

The sixth Annual Meeting of the American Association for Study and Prevention of Infant Mortality will be held at the Bellevue-Stratford Hotel, Philadelphia, November 10–12, 1915. The preliminary "time table" includes:

Wednesday, Nov. 10.

9.30–11.30 A.M. Session on Pediatrics, Dr. Charles A. Fife, Philadelphia, presiding.

2.30–4.30 P.M. Session on Obstetrics, Dr. Mary Sherwood, Baltimore, presiding.

8.15 P.M. Session on Economic Aspects of Infant Welfare, Mr. Sherman C. Kingsley, Chicago, presiding. (Joint session with the Philadelphia County Medical Society at the College of Physicians.)

Thursday, Nov. 11.

9.30 A.M Annual Business Meeting. Mr. Homer Folks, New York, president, in the chair.

1.00 P.M. Subscription luncheon at the Bellevue-Stratford.

2.30–4.30 P.M. Session on Eugenics, Dr. William F. Snow, New York, presiding.

8.30 P.M. General session, Annual address by the President, Mr. Homer Folks.

Friday, Nov. 12.

9.30–11.30 A.M. Session on Nursing and Social Work, Miss Ella Phillips Crandall, New York, presiding.

Additional and later information can be had by addressing the Executiv Secretary of the Association at 1211 Cathedral St., Baltimore, Md.

* * *

International Conciliation is placing the student of contemporaneous history under obligations by publishing the translations of the official "books" prepared by the various governments regarding the present conflict in Europe.

* * *

San Francisco may well be called the Convention City this year. The Director of Congresses has issued a thirty-six page pamflet giving the list of meetings to be held in connection with the Exposition, 822 in all. It is interesting to examine the list and were Solomon living to-day he probably would say, of the making of societies there is no end.

NECROLOGY.

1915.	Jl.	16.	R. M. Woodward.
	Ag.	21.	C. C. Halsey.
		25.	W. F. Muhlenberg.
	S.	13.	J. E. Sheppard.
		22.	Austin Flint, Honorary Member.

GLEANINGS.

That science in general is a basic fact in the development of commerce and industry seems to be fully appreciated in this city,[1] as shown by the establishment of the Mellon Institute of Industrial Research and School of Specific Industries, thru the munificence of two of your public-spirited citizens, Messrs. Richard B. and Andrew W. Mellon. I believe that no act of their lives will give them more enduring satisfaction than this which marks out your city as one more great center of industry which acknowledges the dependence of all advance in material civilization on the quiet labors of the investigator. This dependence has been forcibly exprest by former Ambassador James Bryce in an address to the members of the National Academy of Sciences.

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[1] From the first Mellon lecture, delivered in the Assembly Hall of the Mellon Institute, Pittsburgh, on February 27, 1915.

> You men of science are really the rulers of the world. It is in your hands that lies control of the forces of activity; it is you who are going to make the history of the future because all commerce and all industry is to-day far more than ever the child and product of science. It is in your hands that the future lies, far more than in those of military men or politicians.

Let me also in this connection recall the inspiring words of that great investigator and benefactor of mankind, Louis Pasteur, which point out the still wider influence of science. He wrote:

> Laboratories and discoveries are correlativ terms; if you suppress laboratories, physical science will be stricken with barrenness and death, it will become mere powerless information instead of a science of progress and futurity; give it back its laboratories, and life, fecundity and power will reappear. Ask that they be multiplied and completed. They are the temples of the future, of riches and of comfort. There humanity grows greater, better, stronger. There she can read the works of nature, works of progress and universal harmony, while humanity's own works are too often those of barbarism, of fanaticism and destruction.

And here I shall permit myself to speak more specifically of the paramount importance of chemistry in biological and medical research. The subjects to which I have been calling your attention to-night, *viz.*, the still unknown chemical properties and molecular structure, with the single exception of epinephrin, of the mysterious, correlating substances stored and formed in the many organs of internal secretion, and the equally unknown character of numerous constituents of the circulating blood, both offer a virgin field to the biologist with a chemist's training.—*Prof. John J. Abel, "Science," August 6, 1915.*

LITERATURE NOTES.

WHAT EVERY MOTHER SHOULD KNOW ABOUT HER INFANTS AND YOUNG CHILDREN. By CHARLES GILMORE KERLEY, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital. Paper. Price: 35 cents, net. Pp. 107. New York: Paul B. Hoeber, 1915.

This pamflet was prepared at the suggestion of a child's welfare organization to place in the hands of mothers practical instruction for the care of their infants and young children. The headings of the chapters give the scope of the book, *viz.:* Hygiene, Maternal Nursing, Artificial Feeding, Food Formulas for Well Infants, Feeding from the First to Sixth Year, Diet after the Sixth Year, Dentition, Ailments, First Aid to the Baby, General Considerations, Donts, Formulas.

The need of right instructions and knowledge to the mother for the life and health of her infant and children is manifest. This book is well calculated to help fill this need.

PHILIP ZENNER.

AN OUTLINE FOR INSTITUTIONAL EDUCATION AND TREATMENT OF YOUNG OFFENDERS. By WILLIAM HEALY, M.D., and AUGUSTA F. BRONNER, PH.D., Psychopathic Institute, Juvenile Court, Chicago.

After repeated requests for a statement of what they have learned in their experiences with young offenders, Drs. Healy and Bronner have issued this pamflet giving a very complete outline for institutional work of this kind. The authors do not consider their plan an ideal one, for the work must vary with the conditions in the different institutions, but are glad if their scheme in general proves to be of any value to other workers in the same field. The outline is a very complete one and will doubtless be of much assistance to those who are contemplating entering upon correctional institutional work as well as to those already engaged in the work. It also is of interest to the general reader who is ever ready to appreciate any effort that is being made for the saving of unfortunates to society.

CONSTRUCTIV SOCIAL MEASURES. A Review of Two Years' Work, Department of Social Welfare (The Milbank Memorial Fund) of the New York Association for Improving the Condition of the Poor. June, 1915.

This is a remarkable pamflet or at least a pamflet that excites remark. It may be remembered that Mrs. Elizabeth Milbank Anderson gave a generous gift to the New York Association for Improving the Condition of the Poor to establish a Department of Social Welfare, which was to be engaged by the terms of the gift, in "fostering preventiv and constructiv measures * * * * as distinguisht from relief measures." This pamflet is a report of two years' work of this Department. We quote it as to the Field and the Purpose.

> To act as a research and experimental agency in the field of social welfare, to supplement, when necessary, the work of the public agencies, to co-operate with the public authorities, to assist them in procuring better standards and in enlarging their fields of activity by demonstrating the imperativ needs of the community and the most effectiv way of meeting those needs—such, in part, is the object of the Department of Social Welfare and the justification for its existence. Its methods are positiv, co-operativ and constructiv; its doctrine that of prevention rather than palliation; its spirit grows out of a genuine belief in the ultimate efficacy of the growing social consciousness as an instrument for the correction, by educational and evolutionary methods, of social maladjustments.

In carrying out this purpose it has co-operated with the Bureau of Welfare of School Children, investigating the efficiency of medical school inspection and the sanitary survey of school buildings, making important research and giving valuable assistance and suggestions.

It co-operated with the New York School Lunch Committee whereby there has been an extension of the penny-a-portion lunch service from eight to twenty schools, with the prospect of an immediate extension of the service.

It suggested to the Board of Education the desirability of placing the high school lunch work in the care of the school lunch committee that the service might be operated without profit and demonstrated the ability in connection with high schools where it was possible not only to sell the food at a minimum cost but also to use the lunch room as an educational instrument, and to further this educational value of the school lunch by co-operating with the domestic science course of the school.

From school lunches to public kitchen is but a step, and the committee organized such an institution for the purpose of investigating and for further extension to other parts of the city.

In connection with the Bureau of Food Supplies a sanitary survey of retail stores was made covering a district on the East Side containing a population of 100,000, inspecting every store in the district, placing emfasis on the educational factor.

In addition, other activities such as the standardization of foods, assisting private industrial concerns in the development of a lunch service for the employees, making special food surveys in some of the districts at the request of the departments of charities, and investigating the cost of municipal food distribution, were undertaken.

In co-operating with the Bureau of Municipal Health and Hygiene it made a sanitary survey of public bath facilities and demontrated by its own bath how properly to utilize such facilities. In this connection the laundry facilities of the city were inspected as well as public comfort stations.

These are but some of the activities of this very activ committee. To tell them all would require a republishing of the pamflet, so that an enumeration of the principal activities must suffice for the present. The Association has establisht a People's Bath, a Wet Wash Laundry, a Food Supply Store demonstrating hygienic handling and distribution of foods, a People's Kitchen to which reference has already been made, sundry exhibits and a Public Lecture Staff.

FIFTH ANNUAL REPORT OF THE ROCKEFELLER SANITARY COMMISSION FOR THE ERADICATION OF HOOKWORM DISEASE FOR THE YEAR 1914.

In the creation of this Commission it was hoped it could be of assistance in the cure and prevention of hookworm disease, which had become a menace in the various southern states. The first and most important step to be taken was, as is always the case in efforts of this kind, the education of the people regarding the evil. It was known that the disease existed in the South, but the majority of people were unwilling to acknowledge it, and few physicians were acquainted with it. The Commission began a survey and establisht dispensaries in various counties in the states and with the facts thus obtained won the press, thus securing its valuable aid in the campaign. The physicians became interested, realizing the prevalence of the disease and the importance of controlling and eradicating it. Efforts were made to have instruction given concerning it in those medical schools of the South that had not previously provided such instruction, as well as in the public schools. So that with exhibits, lectures, dispensaries and the distribution of literature, the people of the South have become well informed regarding hookworm disease and while it will doubtless be some time before it is eradicated, the percentage of cases of infection is decreasing and the work begun by the Commission is being carried on by the state boards of health and various other agencies.

THE ROCKEFELLER FOUNDATION INTERNATIONAL HEALTH COMMISSION. First Annual Report, June 27, 1913–December 31, 1914.

The work of this Commission is very similar to that of the Rockefeller Sanitary Commission for the Eradication of Hookworm Disease, the fifth annual report of which we note in this number, that Commission confining its efforts to certain of our southern states while this Commission has the world for its field. It was found that hookworm disease prevails in a belt encircling the world, thirty degrees on each side of the equator, and that in some countries nearly ninety per cent. of the natives are infected. Naturally the existence of such conditions not only prevents the inhabitants from making such progress, intellectually, socially, morally and economically, as they should, but is bound to spread the disease to larger areas especially by emigration. Realizing this, the Commission is working toward the diminution and elimination of existing cases of the disease and the prevention of further infection. We feel confident its results will be as successful in this larger field as they were in the smaller.

COLLECTED PAPERS FROM THE RESEARCH LABORATORY OF PARKE, DAVIS & CO., DETROIT, MICH. DR. E. M. HOUGHTON, Director. Reprints—Volume 3, 1915.

This annual contribution to science is from a research laboratory organized primarily for the furtherance of commercial purposes. At the last meeting of the Academy the papers centered around the thought of medicine as an aid to commerce and transportation. Volumes such as these show the reversal of the process, making commerce an aid to medicine. This volume contains 22 papers publisht during the year, gathered from various scientific periodicals but none of them have a direct bearing upon sociologic medicine.

ACKNOWLEDGMENTS.

[It is intended to acknowledge all publications received since the issue of the last number that are not otherwise noticed. The present list records the publications received (other than periodicals in exchange) from July 22 to September 30, 1915, inclusiv.]

This acknowledgment is considered a full return for the courtesy of sending us the publication. Additional notice will be given when space permits. Publications treating of medico-social questions will be given precedence in the fuller notice.

U. S. Bureau of Labor Statistics: Bulletin No. 170, Foreign Food Prices as Affected by the War. Bulletin No. 176, Effect of Minimum-wage Determination in Oregon. Monthly Review of the U. S. Bureau of Labor Statistics, Volumes 1, 2, 3.

U. S. Bureau of Mines: Technical Paper No. 84, Methods of Preventing and Limiting Explosions in Coal Mines. Technical Paper No. 118, Coke-oven Accidents in the United States, 1913 and 1914.

New York State Department of Labor: Bulletin No. 72, New York Labor Laws of 1915. Fourteenth Annual Report of the Commissioner of Labor, 1914.

Report of the U. S. Commissioner of Education for the year ended June 30, 1914, Volumes I and II.

Report of the Connecticut State Board of Charities for the years ending September 30, 1913 and 1914.

New York Association for Improving the Condition of the Poor: Flies and Diarrheal Disease.

Metropolitan Life Insurance Company: Welfare Work for Policy-Holders. Science and the Public Health.

Removing Visible Restraint from the Harmless Insane. By Will H. Solle, Chicago.

Medical Education and Municipal Hospitals. By August Schachner, M.D., Lousiville. (Reprint.)

The Present Condition of Public Health Organization in the United States. By Prof. Selskar M. Gunn, Boston.

Typhoid Fever: Its Causation and Prevention. By L. L. Lumsden, Surgeon, U. S. P. H. S.

Some Aspects of Behavior and Social Groups. By Frederick Archibald Dewey, New York.

Office International D'Hygiene Publique Bulletin, vii, 4, 5, 6.

Child Betterment and Social Welfare, August and September, 1915.

Social Service Review, August and September, 1915.

A Better Era. By President Charles W. Dabney, University of Cincinnati.

The Medical Pickwick, September, 1915.

British Rule in India. By William Jennings Bryan.

India's Appeal to Canada or an Account of Hindu Immigration to the Dominion. By a Hindu-Canadian.

The American Underwriter, June, 1915.

The Hemlock Spruce. By Oliver A. Farwell, New York.

Notes on Michigan Liliacaeae. By Oliver Atkins Farwell, New York.

Neurographs, Vol. 1, No. 4, June 22, 1915.

The Anti-Prohibition Manual, 1915.

INSTITUTIONS OF LEARNING.

California: Leland Stanford, Jr., University, School of Medicine, Annual Announcement, 1915–16. University of California, Los Angeles Medical Department, Announcement, 1915–16. *Colorado:* University of Colorado, Bull. xi, 4, Je. '15. *Illinois:* Northwestern University, Medical School Announcement, 1915–16. Wheaton College, Bull. xiv, 3, Jl. '15. *Indiana:* Purdue University, Agricultural Experiment Station, Bull. No. 204. *Iowa:* Parsons College, Bull. xiv, 12, Jl. and Ag.; xv, 1, S. '15. *Maryland:* Goucher College, Announcements, 1915–16. University of Maryland School of Medicine and College of Physicians and Surgeons, Announcement, 1915–16. *Minnesota:* University of Minnesota, xviii, No. 3, No. 6, No. 8, No. 19; College of Science, Literature and the Arts, Cat. 1915–16. *Missouri:* University of Missouri, Bull. xvi, 21, Jl. '16. *New York:* Hobart College, Bull. xiii, 4, Jl. '15. University of the State of New York, Bull. 591, May 15, '15. *Ohio:* University of Cincinnati, Record, s 1, xi, No. 2, pt. 6, Ap.; No. 3, Jl. '15. *Pennsylvania:* Juniata College, Cat. 1914–15. Medico-Chirurgical College, Announcement, 1915–16. Philadelphia Polyclinic and College for Graduates in Medicine, 33rd Annual Announcement, 1915–16. Wilson College, Calendar, 1914–15.

REPRINTS.

Acknowledgment is made of the receipt of reprints upon topics of medicine other than medical sociology from Drs. Russell H. Boggs, Pittsburgh; Samuel E. Earp, Indianapolis; Bayard Holmes, Chicago.

MEMBERSHIP IN THE American Academy of Medicine

I.—FELLOWS. *"The Fellows shall be liberally educated physicians, as interpreted by the rules formulated by the Council and adopted by the Academy."* At its organization and for a number of years thereafter the Academy required the possession of an *academic* degree in addition to the "M.D.," because it was the only tangible standard available. With the adoption of satisfactory medical practice acts and the consequent keying up of the better schools of medicine, this is no longer required˙ Any physician deemed by the Council as having shown himself an educated physician is eligible. Admission is secured thru applicatien upon the recommendation of a Fellow and the approval of Council. The initiation fee is Five dollars, the annual dues are Three dollars. Blank applications furnisht on request.

II.—ASSOCIATE MEMBERS. *"Associate members shall be elected from among those working along sociologic, educational or other scientific lines closely related to the work of the Academy, and who have made notable contributions in their respectiv lines."* Election is on proposal of two fellows. There are no financial obligations connected with Associate membership. Associate membership affords the opportunity to secure the cooperation of expert laymen in the deliberations of the Academy. Fellows are urged to send for blank proposals and secure additions to this class of members.

III.—HONORARY MEMBERS. Honorary membership is restricted to physicians.

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